Evaluating the impact of the
School of Business Digital Repository

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A thesis submitted for the degree of
Master of Business
at the University of Otago, Dunedin,
New Zealand

12 June 2009
"ในความมืด ยังมีแสงสว่างเสมอ
ถ้าเราผ่านความมืดนี้ไปได้
เราก็จะรู้ว่าโลกที่สว่างนั้น งดงามอย่างไร"

-- แมทีสันศินีย์ เสกิยะสุธ
To Mom & Dad
Abstract

Otago EPrints is an open access institutional repository at the School of Business, University of Otago. Authors within the school can deposit their work such as journal articles, working/discussion papers, conference papers, theses/dissertation and other research findings.

There has been relatively little evaluation of the use of the Otago EPrints repository, especially with regard to the participation of academic staff and research students (undergraduate, postgraduate and postdoctoral). This thesis describes the findings of a study of authors from the School of Business, with the aim of determining the current state of an author’s publishing experience, attitude, concerns, knowledge, awareness and use of the School of Business EPrints repository.

The findings suggest that Otago EPrints is underpopulated and underused when compared to institutional repositories in other institutions. Moreover, most authors have no motivation to use and little knowledge of Otago EPrints, and some of them still hold some opinions or concerns that have caused them to remain detached from the repository. However, a number of authors have already engaged with the open access movement by making their research outputs publicly available in personal and departmental web sites, as well as in some other open access digital repositories. This implies that it should not be too difficult to persuade them to deposit their research outputs into the repository as they are already familiar with the concepts of open access and depositing papers online.

This research suggests improvements in the process of increasing author awareness and deposit rates; and informs the School of Business division and repository development team of an appropriate service model and workflow for the future.
Acknowledgments

This thesis would not have been possible without the support and encouragement of many people. I would like to take this opportunity to thank a number of people who have helped me through this research study. I am certainly pleased that the light at the end of the tunnel has finally turned into daylight and not the light of an oncoming train.

Firstly, I would like to thank Dr Nigel Stanger, my supervisor, for all the help, advice, and direction he has given me during this research. At times in the course of this research study I benefited from his advice, particularly so when exploring new ideas. His positive outlook and confidence in my research inspired me and gave me confidence. His editing contributed enormously to the production of this thesis.

To everyone that agreed to be part of this study and to the participants that have taken part, without you this study would not have taken place, so thank you.

Within the Department of Information Science, I wish to thank Stephen Hall-Jones for administrative support and the entire technical service group (TSG) within the department for their quick, efficient and helpful technical IT support.

I also would like to thank the following people – Natasha Austin for an EndNote crash lesson in one hour; Wayne Shilcock, Allison Brown, Monica Barkman and Samantha Charlton for proofreading this thesis.

Lastly, but by no means the least, I would like to thank my beloved family, Mom, Dad, my sisters as well as my girlfriend Gift, who are currently in different parts of the world for their unconditional love, encouragement, inspiration and support. They all have been there for me, always pushing me on, asking how my work was going and making sure that I kept at it. Thank you again and I love you all.

This study would not have been possible without the support of my parents. I, therefore, would like to dedicate this work to Mom and Dad.

Thank you very much.

Charupol (Ake) Sanmaneechai
June 2009
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Part I

Literature Review and
Repository Overview
Chapter 1

Introduction

This chapter will discuss the purpose and importance of this study as well as outlining the study questions and providing brief definitions of technical terms in the glossary section. An overview of this report will also be provided.

1.1 Aim/Purpose of the Study

In recent years, academic libraries have launched major initiatives to make their resources more easily available to users. Consequently, digital repositories have become a very popular topic and large numbers of the institutions (such as the University of Otago) are currently employing them.

The rapid increase in the number of digital repositories worldwide gives authors the ability to disseminate scholarly outputs to others in order to make effective use of material that might remain “unpublished and inaccessible” otherwise. In recent years, there have been quite a few studies regarding open access (Hedlund, 2008), including large studies on author opinions regarding open access journals (Lynch and Lippincott, 2005; Markey, Rich, Jean, Kim, and Yakel, 2007).

In most studies on institutional repositories, the attention has been focused for several years on implementation, features and interoperability. Other studies, focusing on the evaluation of repositories, included growth rates for submission, as well as content and material types.

Otago EPrints is an open access institutional repository at the School of Business, University of Otago, where the authors within the school can deposit work such as journal articles (preprint and postprint), working/discussion papers, conference papers, theses/dissertations and other research findings. Moreover, the repository can
be searched by others via the Internet and the information can be accessed free of charge.

This study was carried out to understand how visitors use the School of Business digital repository, to investigate the impact on authors who had deposited their research outputs in the repository, and to examine authors’ expectations and attitudes towards open access publishing. This study also focuses on acceptance and user behaviour regarding institutional repositories. It will attempt to answer the following questions:

- How much do authors know about the School of Business Repository and its contents?
- Has the School of Business Repository affected the availability and dissemination of authors’ research outputs?
- Has placing material in the School of Business Repository had an impact on citations and contact from other researchers?
- What are authors’ perceived issues with placing research outputs in the School of Business Repository?
- What other online repositories (or similar) are authors using and why?
- How willing are authors to place research outputs in the School of Business Repository compared to other online repositories?

1.2 Importance of the Study

There has been no author study with regards to the School of Business EPrints repository since it was launched in November 2005. This study is the first attempt to investigate authors’ awareness and attitude toward the Otago EPrints digital repository. Data for the study were gathered by means of a questionnaire and associated face-to-face interview.

The results of this study will assist in the future implementation and administration of the School of Business digital repository and help inform the School of Business division and repository development team with regard to appropriate service models, policies and workflows.
1.3 Overview

The structure of the report is as follows:

1.3.1 Part I: Literature Review and Repository Overview

Chapter 1: Introduction.

In Chapter 2, the definition of open access and several important open access statements and declarations are described and discussed in detail for readers who are less familiar with this subject.

Chapter 3 then provides information about different types of digital repositories, including examples of institutional and subject-based digital repositories. This chapter also addresses both the potential benefits and barriers associated with open access digital repositories. An in-depth explanation of each is given.

Chapter 4 will cover the development of digital repositories over the past few years in New Zealand and other countries including the United States, Europe, the United Kingdom, Japan and Australia.

Chapter 5 presents an overview of different common repository software platforms available today, including EPrints, Fedora and DSpace.

Chapter 6 provides a background on the School of Business digital repository. The repository workflow of Otago EPrints is also outlined.

Chapter 7 carries out a statistical review of the School of Business digital repository. This review discusses the growth of the repository and the number of downloads with regards to abstract pages and full-text documents.

1.3.2 Part II: Author Study

Chapter 8 describes the methodology of the author study, including details of the process used to select participants and questionnaire design. The questionnaire used in this study is broken down question by question and a justification of why each question was asked is provided.

The results and the findings from the interviews and questionnaire are given in Chapter 9. These results are used to support and answer the study questions outlined
in the previous section. Descriptive statistics are used in this chapter to demonstrate the findings.

Finally, Chapter 10 provides the conclusion, along with recommendations for addressing the issues found by this study.

1.4 Definition of Terms

**Australian Research Repositories Online to the World (ARROW):** Australia’s ARROW project is funded by the Australian Federal Government’s Department of Education Skills and Training (DEST), and aims to identify and test software or solutions to support the best practice of institutional digital repositories comprising e-prints, digital theses and electronic publishing (Heery and Anderson, 2005).

**Citation Impact:** Citation impact is a count of the number of citations (or references) to an academic article. It is often used as a measure of the impact an article has had within its particular field. For instance, if an article is widely read and cited, it indicates the article has had influence on other researchers and research within the field (Brody et al., 2004).

**DSpace:** The DSpace institutional repository system is open source software (written in Java) for building and managing digital repositories. The first public release was in 2002. DSpace is freely available to institutions or research organisations as an open access system that can be customised and extended (DSpace, 2009).

**EPrints:** EPrints is free, open source software developed at the University of Southampton, dedicated to encouraging the spread of open access repositories. The EPrints software is widely used for open access repositories around the world (EPrints, 2009).

**E-prints:** An electronic version of research outputs which include preprints and postprints of journal articles, conference and working papers.

**Excellence in Research for Australia (ERA):** The ERA initiative aims to identify and promote excellence across the full spectrum of research activity, including discovery and applied research, in Australia’s higher education institutions (Australia Government, 2009). It replaces the abandoned Research Quality Framework (RQF).
Fedora (Flexible Extensible Digital Object Repository Architecture): A software technology that may be used for building open access repositories. It was originally developed by Cornell University and the University of Virginia. It is now managed by Fedora Commons (Fedora Commons, 2009).

Harvester: “A harvester is a client application that issues OAI-PMH requests. A harvester is operated by a service provider as a means of collecting metadata from repositories” (Openarchives.org, 2009).

Metadata: Information used to describe an object; in this report this refers to data that describe other data. For items in open access repositories, this usually consists of a bibliographic reference, abstract, keywords, or similar information.

Open Access (OA): Open access describes the effort to grant access to a large variety of “up-to-date” information sources for free; that is, allowing all public members to freely access relevant cultural and scientific achievements (R. Jones, Andrew, and MacColl, 2006).

Open Access Repositories in New Zealand (OARiNZ): The OARiNZ project (led by Christchurch Polytechnic Institute of Technology). This aims to design and build the infrastructure necessary to connect all of New Zealand’s digital research repositories which meet interoperability and access standard (OARiNZ, 2009).

Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH): This protocol provides an application-independent interoperability framework based on metadata harvesting (Openarchives.org, 2009).

OpenDOAR: OpenDOAR is an authoritative Directory of academic Open Access Repositories (OpenDOAR, 2009).

Open Source Initiative (OSI): The Open Source Initiative (OSI) is a non-profit corporation dedicated to managing and promoting the benefits of open source, and to building bridges among different constituencies in the open-source community (Opensource.org, 2009).

Open Source Software (OSS): Software to which the source code is available under an open source licence such as the GNU Public License (GPL) or the BSD license (R. Jones et al., 2006).

Performance Based Research Fund (PBRF): The PBRF is the New Zealand government’s formal tertiary institution research performance assessment, managed
by the Tertiary Education Commission. Its main purpose is to encourage and reward research excellence in New Zealand’s tertiary education sector (Tertiary Education Commission, 2009).

**Postprint:** “The final version of an academic article or other publication - after it has been peer-reviewed and revised into its final form by the author. As a general term this covers both the author’s final version and the version as published, with formatting and copy-editing changes in place” (SHERPA, 2009).

**Preprint:** “In the context of Open Access, a preprint is a draft of an academic article or other publication before it has been submitted for peer-review or other quality assurance procedure as part of the publication process. Preprints cover initial and successive drafts of articles, working papers or draft conference papers” (SHERPA, 2009).

**Research Assessment Exercise (RAE):** A series of exercises conducted nationally to assess the quality of research from the United Kingdom and to inform the selective distribution of public funds for research by the four British higher education funding bodies (RAE2008, 2009).

**Repository:** A service that aims to collect and preserve an electronic copy of the intellectual output of a subject or organisation. An open access repository does this without any restrictions (such as a charge) to the public.

**Self-archiving:** The concept of an author depositing their own metadata (such as abstract and bibliographic reference) and an electronic full text for one or more publications into an online open access repository (R. Jones et al., 2006).

**SHERPA/RoMEO:** SHERPA (Securing a Hybrid Environment for Research Preservation and Access) is a project from the United Kingdom dedicated to promoting the implementation and use of open access repositories. RoMEO is a copyright transfer and open access policies database of academic publishers and journals. RoMEO is a sub-project of SHERPA (RoMEO, 2009; SHERPA, 2009).

**Working paper:** A paper in the process of being authored, possibly for submission to a journal or conference.

The next chapter introduces and discusses the importance of open access. Several important open access statements and declarations are outlined in detail.
Chapter 2

Introduction to Open Access

2.1 Open Access Defined

The open access movement first became popular in the 1990s (Pappalardo, Fitzgerald, Fitzgerald, and Kiel-Chisholm, 2007). It is the concept of making digital research or academic literature freely and publicly available across the Internet to anyone who wishes to access it from anywhere in the globe. This is a change from traditional academic publishing where readers have to pay a subscription charge (R. Jones et al., 2006). An open access article has limited copyright and licensing restrictions, which means that anyone with access to the article may read, download, copy and distribute that article (Suber, 2009). In addition, open access is the reason behind the popularity of digital repositories (Woodland and Ng, 2006). Pappalardo, et al. (2007) further describe the benefits of making the research outputs open access. By improve the access to information; this will enable the researchers to “study their field more broadly, [also] reducing the amount of duplicative research and assisting in the production of better informed – and therefore better quality – research”.

Furthermore, Tenopir (2004), a leading scholar on academic publishing at the School of Information Sciences, University of Tennessee, has explained briefly that open access:

includes many publication and distribution schemes. E-journals that are published, distributed electronically, and subsidized by universities, government agencies, and volunteer organisations are the most common. In addition, collections of separate articles or research reports could fit the definition, including e-print servers such as arXiv.org, institutional repositories, and author web pages.
Typically, open access digital repositories are open electronic collections, easily and freely accessible to anyone with Internet access. They are becoming increasingly common and are a great way to share outputs with a wider community across the world.

Some examples of early open access journals include the Electronic Journal of Communication. This was a free online peer-reviewed journal (launched September 1990), the Electronic Journal of Analytic Philosophy (launched August 1994), and the Electronic Journal of Sociology (launched September 1994).

I can say with confidence that as of the end of 2003, there are just under 50,000 scholarly journals and somewhere between a third and just over half of them are [publicly available] in digital form. One thing I’ve learned is that these numbers are a moving target and somewhat suspect. Keep checking and keep definitive statements necessarily vague (Tenopir, 2004).

2.2 Open Access Statements and Declarations

The open access movement has developed over the years after it started out with a series of statements and declarations from various groups of people. There were three major international meetings over time which have progressed the concept of open access. The first meeting was in Budapest, Hungary in December 2001, the second in Bethesda, USA in April 2003 and the third major meeting was in Berlin, Germany in October 2003 (Budapest Open Access Initiative, 2002; R. Jones et al., 2006; Max Planck Society for the Advancement of Science, 2003; Suber, 2003). For a more formal definition, the major international declarations and statements in support of open access worldwide are set out in this section.

2.2.1 Budapest Open Access Initiative (BOAI)

BOAI is considered to be the first well-known international open access statement, launched in 2002. The main purpose of BOAI is to speed the progress of disseminating scientific literature and making it freely available to the public from academic researchers by self-archiving published articles and open access journals. Therefore, without access barriers this will “share the learning of the rich with the poor and the poor with the rich” and also “lay the foundation for uniting humanity in a common intellectual conversation and quest for knowledge” (Budapest Open Access Initiative, 2002).
BOAI defines open access as a collection of research outputs that are made freely available on the internet (Budapest Open Access Initiative, 2002):

permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the Internet itself.

BOAI further identified two methods to make research output open access to achieve its proposed goals (Budapest Open Access Initiative, 2002; C. Jones, 2007):

1. **Self-Archiving** is where researchers deposit their copy of the peer-reviewed article in an open access repository, so it could be then easily located via search engines in order to find and make use of the contents. Moreover, Harnad (2006) further stated that open access “self-archiving is a supplement to – not a substitute for – publishing in a peer-reviewed journal”.

2. **Open Access Journals**: This method of dissemination is introduced to eliminate the access barriers such as price and permission. This is “a new generation of journal committed to open access” without any subscription or access fee (Suber, 2007). However, these open access journals will be funded by other means and will increase access to both new and existing journals, over traditional models of publishing, making the articles freely and publicly available to the end user (C. Jones, 2007).

As of April 2009, 4996 individuals and 484 organisations have joined the Budapest Open Access Initiative (Budapest Open Access Initiative, 2002).

### 2.2.2 Bethesda Statement on Open Access Publishing

The Bethesda Statement was a follow up to the Budapest Open Access Initiative, which came out of a one-day meeting of scientists in the biomedical subject area. In addition, the resulting Bethesda Statement on Open Access Publishing outlined two criteria for publications to be considered to be open access (Suber, 2003):

1. The author(s) and copyright holder(s) grant(s) to all users a free, irrevocable, worldwide, perpetual right of access to, and a license to copy, use, distribute, transmit and display the work publicly.

2. A complete version of the work and all supplemental materials, including a copy of the permission as stated above, in a suitable standard electronic format is deposited immediately upon initial publication in at least one online
repository that is supported by an academic institution, scholarly society, government agency, or other well-established organisation that seeks to enable open access....

See Appendix A for the full version of Bethesda Statement on Open Access Publishing.

2.2.3 Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities

In October 2003, the Max Planck Society in Germany arranged an Open Access to Knowledge in the Sciences and Humanities meeting, and introduced the Berlin Declaration on Open Access. It was drafted to initially “promote the Internet as a functional instrument for a global scientific knowledge base and human reflection” (Max Planck Society for the Advancement of Science, 2003) and supports the benefits of making “resources and contributions” publicly available on the Internet for all to access (Pappalardo et al., 2007). Moreover, the Berlin declaration also provides the definition of open access as “a comprehensive source of human knowledge and cultural heritage that has been approved by the scientific community” (Max Planck Society for the Advancement of Science, 2003), which mirrors the definition in the Bethesda Statement. Typically, the Berlin Declaration is almost the same as the Bethesda Statement, just with some added detail. See Appendix B for the full version of the Declaration.

Furthermore, based on these definitions provided earlier, Velterop (2003) has outlined what he terms the ‘essentials’ of open access:

There are three main essentials: free accessibility, further distribution, and proper archiving. Open access is real open access if:

- The article is universally and freely accessible, at no cost to the reader, via the Internet or otherwise, without embargo.

- The author or copyright owner irrevocably grants to any third party, in advance and in perpetuity, the right to use, copy, or disseminate the article, provided that correct citation details are given.

- The article is deposited, immediately, in full and in a suitable electronic form, in at least one widely and internationally recognized open access repository committed to open access and long-term preservation for posterity.
The Berlin Declaration has been significant in advancing open access to research and scholarly outputs. As of April 2009, the Berlin Declaration has been signed by 262 organisations from all over the world.

### 2.3 Gold Model vs. Green Model

Two broad models of open access have emerged over the past few years, known as green and gold (S Harnad et al., 2004; Williams, 2008).

The first and more common model is the green model (also known as open access self-archiving). It is a new method of disseminating information whereby the authors deposit an electronic version of their work in a variety of open access locations from subject-based repositories (such as PubMed Central and ArXiv), to an institutional repository (such as the the Otago ePrints repository) or to a personal (or departmental) website.

The vast majority of publishers now support the green model by enabling authors to self-archive in this way. Gadd, Oppenheim, and Probets (2003) reported that in 2002, less than half of the publishers in their study permitted both preprint (before peer review) and postprint (after peer review) self-archiving, a third of the publishers allowed postprint and twenty percent specified postprint only. A further study carried out by Cox and Cox (2003) found that sixty percent of the publishers allowed authors to deposit the final published version. According to statistics from the RoMEO\(^1\) service (a valuable source which tracks the self-archiving policies of journal publishers), as of May 2009, out of a total of 10,520 journals, thirty-one percent permitted only preprints to be posted and sixty-three percent allowed postprints, for a total of 329 publishers (62% of a total publishers registered with ROMEO) that permitted self-archiving (RoMEO, 2009). See Figure 2.1, where:

- **GREEN** = The authors have the publisher’s permission to self-archive refereed postprint (i.e. final draft post-refereeing);
- **PALE-GREEN** = The authors have the publisher’s permission to self-archive pre-refereeing preprint (i.e. pre-refereeing);
- **GRAY** = The authors have no permission yet from the publisher.

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\(^1\) RoMEO (Rights Metadata for Open Access Archiving) (http://romeo.eprints.org/)
A major disadvantage of the green model is that there can be a lack of quality assurance because the research outputs that are deposited in the repository may have no “formal, external quality control [such as peer-review] checks” (C. Jones, 2007).

There are two kinds of ‘green’ open access repositories. Green open access institutional repositories rely on the maintenance of the repository by the institutions to collect the research outputs together in one place. As a result, this reflects on the quality of work within the repository and also on the status of that institution. This has the advantage of management control responsibility and deposit encouragement. However, the potential lack of quality control still remains. (For instance, the University of Otago is planning to establish a PBRF-eligible open access digital repository to overcome the quality assurance issue. This means all open access research outputs deposited in the repository must be reviewed in order to assure the quality of the research outputs in the repository). There are open source software platforms available for the green model; the best known being EPrints, DSpace, Fedora and ePubs (Houghton, Sheehan, and Steele, 2006).

Apart from green open access institutional repositories, there are also green thematic (subject-based) repositories which are used by the community where relevant information on a particular subject area is collected together. ArXiv, a repository for the community in the field of physics, mathematics, computer science, quantitative biology, quantitative finance and statistics (Cornell University Library, 2009), is the best known example of this. It is built and maintained by a group of people in the community. Moreover, the contents in the ArXiv repository itself “conform to Cornell

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2 An up-to-date version of this chart can be viewed at http://romeo.eprints.org/stats.php
University academic standards” (Williams, 2008). Essentially, the quality standard of the subject-based repository is maintained by a group of members in the community.

The second open access model is the gold model (also known as open access publishing) where the author must pay a fee to the publisher at publication time but the article is freely available. Examples of this gold model are BioMed Central\(^3\), Science Direct\(^4\) and the Public Library of Science\(^5\). The gold model can pose a problem for authors who do not have sufficient funds to pay for submitting articles.

The next chapter defines and describes both institutional and subject-based digital repositories in more detail. It will also discuss the benefits and barriers to open access. The discussion of the importance of open access in the research community and the relationship with the digital repositories is also carried out in Chapter 3.

\(^3\) BioMed Central (http://www.biomedcentral.com/)

\(^4\) Science Direct (http://www.sciencedirect.com/)

\(^5\) Public Library of Science (http://www.plos.org/)
Chapter 3

What is a Digital Repository?

3.1 Introduction

This chapter will provide a background on literature. Section 3.2 defines digital repositories and discusses about their characteristics and types that make them differ from the traditional digital collection. Section 3.3 introduces institutional repositories, and provides the definition of institutional repositories from different points of view. A comparison of institutional repositories and subject-based repositories will be provided and followed by a discussion of the success of open access digital repositories. Finally, sections 3.4 and 3.5 outline and discuss the benefits and barriers to open access.

3.2 Digital Repositories

A digital repository is a digital content store where authors and academics can deposit their research outputs, with the intention that they will be publicly available in digital form and can be searched and retrieved. The technologies are used to guarantee that the digital contents are preserved for long-time use. The digital repository can also be outsourced to an organisation that has responsibility for the long-term maintenance of digital resources and also for making these resources available to communities of users or the public (Research Libraries Group Inc (RLG) and Online Computer Library Center (OCLC), 2001). Typically, digital repository is a relational database, which stores and keeps track of the metadata records for files stored in the data storage facility (Burton, Blackall, and Yeadon). In addition, a digital repository can store and manage various file formats, more than just text file formats, like Microsoft Word or PDF documents:
A Digital Repository is essentially... a database that allows the storage, sourcing and retrieval of resources, or learning objects, in a variety of standard formats including HTML files, images and animations (Littlejohn and Pegler, 2007).

The digital repositories are currently being implemented more widely for organisations and institutions across the world. Heery and Anderson (2005) define in their ‘Repositories Review’ for JISC the fundamental characteristics that allow digital repositories to differ from other digital collections such as catalogues or databases:

- Content is deposited in a repository, whether by the content creator, owner or third party.
- The repository architecture manages content as well as metadata (a record describing the content, like a catalogue record).
- The repository offers a minimum set of basic services e.g. put, get, search, access control.
- The repository must be sustainable and trusted, well-supported and well-managed.

Heery and Anderson (2005) also further discuss a variety of digital repository types that can be categorized by:

- Content Type: research data, journal/conference proceedings papers, scholarly papers, learning objects or corporate records.
- Coverage: personal, journal, departmental, institutional, national or international.
- Functionality of the repository: enhanced access to resources, preservation of digital resources, institutional asset management or enhanced sharing and re-use of resources.
- Target user groups: researcher, teacher or students.

### 3.3 Institutional Repository Defined

The term “institutional repository” tends to have a very wide range of definitions. It may mean many different things to many different communities, and can be used in a variety of ways. The institutional repository content types may include research articles (both preprints and postprints), dissertations/theses, working papers, technical reports, teaching materials and conference papers produced by members of an institution.
In simple terms, an institutional repository is a web-based database (repository) with services that are able to store, index and preserve a university’s scholarly research output in digital formats, and make these materials freely and easily accessible (Barton and Waters, 2004).

Cervone (2004) has precisely defined an institutional repository as “software and services that manage and disseminate digital materials for an entire institution”. All things seemed to be equal in Cervone’s definition, in that the managing the material in repositories is as important as the dissemination of material. It is not always necessary that all institutional repositories have the same goals; however they do need to share similar aims.

According to Lynch (2003), Director of the Coalition for Networked Information (CNI)\(^6\), an institutional repository is “a set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members.”

Lynch (2003) further mentions about the essential commitment of a repository “to the stewardship of these digital materials, including long-term preservation where appropriate, as well as organisation and access or distribution”. He also claimed “the institutional repository isn’t a journal, or a collection of journals, and should not be managed like one” (Lynch, 2003).

Essentially, there are two opposing sides among those who work to define what an institutional repository is. Lynch defines institutional repositories as complementary services to traditional publishing, by commitment from the members of the institution, rather than emphasis on a particular software product or type of content. In contrast, Crow (2002) from SPARC (Scholarly Publishing and Academic Resources Coalition) sees institutional repositories as competition to traditional publishing, defining the concept in terms of the origins of the material.

Crow states,

institutional repositories are digital collections that capture and preserve the intellectual output of university communities... An institutional repository could be any collection of digital material hosted, owned or controlled, or disseminated by a college or university, irrespective of purpose or provenance. (Crow, 2002)

\(^6\) CNI (http://www.cni.org/)
Crow further argues that one of the major goals in having an institutional repository in-house is increasing access to the literature. He believes that by taking some control over the dissemination of scholarship by the academy, repositories can increase competition in the community and reduce the monopoly power of journals.

Institutional repositories were built on top of the growing “grassroots” of depositing research outputs online; for example on personal websites, departmental websites and subject based repositories. The main purpose of the institutional repository is to disseminate an institution’s academic work. It is also believed to be a “practical, cost-effective, and strategic means for institution to build partnerships with their faculty to advance scholarly communication” (Johnson, 2002).

Crow (2002), Jones, Andrew, and MacColl (2006), Johnson (2002) and Shearer (2003) define the characteristics of institutional repositories in greater detail and suggest that an institutional repository should meet the following criteria:

- **Institutionally Defined**
  The repository has to manage, store and preserve the original research outputs and other “intellectual property” (Crow, 2002) created by authors in various institutional departments.

- **Scholarly and Digital**
  The institutional repository can contain research outputs in any formats generated by the institution’s students, academic researchers and staff. These materials may include reports, theses, video recordings, datasets, photographs, computer programs or any other digital material that the institution wishes to preserve. All of the materials must be “of some academic value” (R. Jones et al., 2006); which could be preprints, postprints, other works in process, peer reviewed articles and monographs.

- **Cumulative and Perpetual**
  The repository itself should continue to gather material and to store and preserve those accessible materials on a long-term basis.

- **Open Access and Interoperable**
  The institutional repository should provide no (or a low) barrier to access the research outputs created by students, researchers and staff within an institution. This is the only way an institutional repository can interact with
other repositories. It is required that the users outside the institution’s community are able to gain access to the stored content.

3.3.1 Institutional vs. Other Type of Repositories

In the research community, institutional repositories should be differentiated from other types of repositories that have already been established. The most well known examples of these are subject-based digital repositories that have been developed over the last fifteen to twenty years.

ArXiv was the very first e-prints (both pre- and postprints) repository, launched in 1991. As of April 2009, it has provided open access to 532,251 papers in various disciplines, including Physics, Mathematics, Computer Science, Quantitative Biology, Quantitative Finance and Statistics (Cornell University Library, 2009). By publishing items in online digital repositories, authors had the possibility to make their latest findings publicly available to a worldwide audience, long before the printed version of the peer-reviewed article would be published.

Over time, more subject-based digital repositories in other disciplines have begun to appear (see Table 3.1 for a selection). For instance, in the biomedical and life science area, the National Library of Medicine introduced PubMed Central, a free digital archive of biomedical and life sciences literature. Since its release in 2002, and as of April 2009, PubMed Central has more than 1.5 million (1,530,623) articles accumulated in the repository (PubMed Central, 2009).

On the other hand, when the term ‘institutional repository’ is mentioned, most people use the word ‘institutional’ to refer an educational or research establishment. As Jones, Andrew and MacColl (2006) reinforced that “Institutional repositories have emerged from universities, but are spreading into other types of educational organisations too, such as colleges and research institutes”. Therefore, it is valid to say that research repositories were until quite recently based only around disciplines.

Furthermore, as there are different types of repositories and open access is a core component of the repository movement, interoperability between different kinds of repository is needed. This can be achieved by making repository systems compliant with a worldwide standard called the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH). It creates the potential to expose multiple forms of metadata about the contents of a repository on the Internet so that it can be harvested.
<table>
<thead>
<tr>
<th>Academic Field</th>
<th>Subject-Based Repository</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics and Mathematics</td>
<td>ArXiv</td>
</tr>
<tr>
<td></td>
<td><a href="http://www.arxiv.org">www.arxiv.org</a></td>
</tr>
<tr>
<td>Computer Science</td>
<td>Networked Computer Science Technical Reference Library</td>
</tr>
<tr>
<td></td>
<td><a href="http://www.ncstrl.org">www.ncstrl.org</a></td>
</tr>
<tr>
<td>Cognitive Science</td>
<td>CogPrints</td>
</tr>
<tr>
<td></td>
<td><a href="http://www.cogprints.org">www.cogprints.org</a></td>
</tr>
<tr>
<td>Economics</td>
<td>Research Papers in Economics (RePEc)</td>
</tr>
<tr>
<td></td>
<td><a href="http://www.repec.org">www.repec.org</a></td>
</tr>
<tr>
<td>Astronomy, astrophysics, and geophysics</td>
<td>NASA Technical Report Server</td>
</tr>
<tr>
<td></td>
<td>ntrs.nasa.gov</td>
</tr>
<tr>
<td>Biomedical and life sciences</td>
<td>PubMed Central</td>
</tr>
<tr>
<td></td>
<td><a href="http://www.pubmed.org">www.pubmed.org</a></td>
</tr>
</tbody>
</table>

Repository metadata can be made accessible through commercial third party OAI search engine service providers such as OAIster, Yahoo!, Google Scholar, and Elsevier’s Scirius scientific search service, as they collect metadata gathered from different repositories into a searchable database. Then, end users can search harvested metadata by using these search engines or OAI search facility, without the need for authentication, payment, special software or other limitations. This means the location of the full text itself does not matter to end users.

However, end users – i.e., those who are searching and accessing repository content – are likely to notice little, if any, difference between institutional and subject-based repositories. This is because most users are likely to search for an item, not on the repository web site itself, but on a search engine that harvests metadata from various repositories (both institutional and subject-based repositories).

Finally, since many institutions around the world have an interest in having their repositories successfully in place, they may create an incentive for departments to deposit their research outputs in different fields, such as medicine, science, and economics.
3.4 Benefits of Open Access Digital Repositories

There are benefits to implementing a digital repository, including the opportunity to provide ranges of an institution’s educational resources to University departments. This may have a positive impact on the reputation of the institution’s research outputs (Pinfield, Gardner, and MacColl, 2002). In addition, there have been many studies in recent years regarding possible citation advantages.

Citations are considered to be one way to measure how successful or useful a research output is, and they are also becoming a part of the standard evaluation process of various departments in Universities worldwide. A research output that has a low citation rate may indicate that this particular research has not been well conducted or represented, or it may indicate that the output has been published in a low-impact or obscure venue.

Several studies (Antelman, 2004; Brody, et al., 2004; Eysenbach, 2006; Harnad, 2003; Lawrence, 2001; Odlyzko, 2002) have illustrated that authors who make their published research outputs freely available online are more likely to receive more citations and achieve greater impact than the authors whose research outputs remain behind subscription barriers (often known as toll access or closed access), which only a person or institution with a subscription can access.

One way to estimate this effect is to compare the citation counts for open access articles with subscription-based articles. Lawrence (2001) from the NEC Research Institute at Princeton has undertaken such a study and was the first to demonstrate that online open access computer science conference articles were 4.5 times more frequently cited than articles that are only available for payment print or online. Lawrence further stated “there is a clear correlation between the number of times an article is cited and the probability that the article is online”. Although this study was limited to computer science, it brought researchers’ attention to the importance and benefits of making their work open access.

In addition, Harnad, et al. (2003) analysed the relationship between article hits and online citations using the ArXiv.org E-Print Archive, an open access digital subject repository. They reported that the correlations between the article hits and citations “are quite big, and range from .3 to .6 or higher, and seem to vary somewhat with field and subfield”.

In support of Lawrence’s initial finding, there have been a number of other studies which also concluded that making research outputs open access will result in greater impact.
Brody, et al. (2004) carried out a study across all disciplines, between 1992 and 2001 and a sample of 14 million articles in total. This study used ‘citation impact’ as a standard measurement, which is basically the count of the number of citations of an article. Citation Impact can be used as a “measure of the impact an article has had within its particular field” (Brody et al., 2004). The initial results of this study, for the field of physics, illustrates clearly that open access articles are being cited 2.5 – 5 times more than articles that users have to pay for in order to retrieve required information, “with this advantage peaking within about 3 years of an article’s publication” (Brody et al., 2004). Likewise, Antelman (2004) sampled across four different disciplines (philosophy, electrical and electronic engineering, political science and mathematics), and Odlyzko (2002) did a similar study in mathematics, both reporting similar results. Antelman (2004) further indicated that:

across a variety of disciplines, open access articles have a greater research impact than articles that are not freely available.... The relative increase in citations for open access articles ranged from ... 45% in philosophy to 51% in electrical & electronic engineering, 86% in political science, and 91% in mathematics.

A larger study was carried out by Hajjem, Harnad and Gingras (2005) across the 10 disciplines of biology, sociology, education, business, administration, economics, health, political science, psychology and law, over 10 years and a total of 1,307,038 articles. This study again produced similar results. Hajjem, et al. (2005) further concluded “comparing OA [open access] and NOA [not open access] articles in the same journal/year, OA articles have consistently more citations, the advantage varying from 25-250% by discipline and year”.

Figure 3.1 shows results from a 10-year tracking of citations. Shown is the ratio of citations of open-access articles to citations of non-open access articles published in the same issue of a given journal, averaged by discipline.
In addition, a recent study by Eysenbach (2006) provides strong evidence that open access articles are more immediately recognised and cited than non-open access articles. Eysenbach compared citations of the articles published in the same journal, Proceedings of the National Academy of Science (PNAS) between June 2004 and December 2004. The result of this study is clear that articles made available through open access gained significant citation advantages over the articles that remained behind subscription (non-open access). During four to ten months after publication, open access articles are twice more likely to be cited than non-open access articles, and almost three times between ten to sixteen months. Eysenbach (2006) further concluded “open access is likely to benefit science by accelerating dissemination and uptake of research findings”.

Despite the number of studies showing that making articles open access will raise the number of citations, there has been much discussion and argument on the cause of these open access citation advantages.

A study by Kurtz, Eichhorn, Accomazzi, Grant, Demleitner, Henneken, et al. (2005) is the “first study to control for early access and selection bias” (Williams, 2008) for astrophysics journals. The results reveal there is no open access citation advantage, for both selection bias and early access, for the articles in that area. Therefore, increasing accessibility to existing articles does not increase the probability they will be cited.
Kurtz, et al. (2005) further argue that “the claims that the citation rate ratio of papers openly available on the internet (via ArXiv or some other mechanism) versus those not available through those means is caused by the increased readership of the open articles...are somewhat overstated”.

In the future, as open access spreads, its citation advantage will probably disappear. However, its advantage in terms of research impact and contribution will continue to increase (Kurtz et al., 2005).

### 3.4.1 Further benefits of digital repositories

Apart from citation counts, digital repositories have further benefits. Firstly, open access entails information in the digital repository is free for all. The information in repositories that are openly accessible online can be located and retrieved easily and immediately by those who are interested, from anywhere with an Internet connection. Open access repositories are freely available online; therefore this enables access by people who are not able to afford to pay (e.g., people in poorer countries), and knowledge is no longer limited by the “wealth of a library, institution, or the economy of a country” (Williams, 2008), for a conventional publication subscription fee to access and utilise the knowledge and information.

Second, open access digital repositories allow more research to be freely accessible to a wider population across the world. Many institutions and organisations world-wide have implemented digital repositories to enhance “visibility and accessibility” (Mueller, Murali, Cha, Erwin, and Ghosh, 2006) of their research outputs and reputation. "Visibility" usually refers to the “probability that a publication will be seen and disseminated, while “impact” concerns its long-term reception and the extent to which its findings influence future research and scientific debate” (Open-access.net, 2008).

Furthermore, Swan and Carr (2008) have also stated the primary reason for establishing a digital repository is to maximise the visibility of an institution’s research output by making it public access. Almost every institution cited this as the most important reason (including the University of Otago School of Business). Theoretically, a digital repository is the ideal means for making the research outputs of an institution visible to other institutions, and to individuals, across the world. Consequently, the visibility of research outputs will enhance recognition for an institution’s academic quality and the reputation of authors and their institutions (or organisations).
Next, open access digital repositories allow greater research efficiency through early discussion of findings and enable the sharing of knowledge. The repositories also provide researchers an ease of access to each other’s work. This then encourages researchers to develop new ideas based on what other researchers across the world have already done, enabling collaboration at a world-wide level.

Finally, open access digital repositories will help to preserve and allow long-term access to the information stored in the repository, as this is initially one of the objectives of having a digital repository in place. The information will be kept, stored and preserved in digital file formats. Furthermore, the files can always be accessible (usable, viewable and searchable) whenever they are needed at any time and from anywhere.

### 3.5 Open Access Barriers

The reasons why most researchers publish their work onto an open access repository are to enhance visibility and accessibility (Mueller et al., 2006) of the articles and to get their research disseminated to as many as possible (A Sale, 2006; A Swan, 2006). Although a number of studies have shown the benefits of open access there is still hesitation among researchers and institutions.

Studies have been carried out to determine what may discourage researchers from making their work open access. A study undertaken by Klang (2008) investigated the barriers to open access by looking at eight universities in Sweden that had implemented online digital repositories. The results of the interviews reflect different areas of concern with regards to open access.

The first major barrier is the “research culture” (Klang, 2008) and it is considered to be the biggest issue (A Swan, 2006). There were difficulties in changing the culture of researchers, who ignore open access and prefer to publish their papers in traditional subscription-based journals. Swan and Brown (2005) found 81 percent of researchers would “comply willingly” if an article was required to be deposited in an open access archive, a further 13 percent indicated they would “comply reluctantly”, and only 5 percent said they would refuse to comply. The only way to get open access to work for all is to lean toward the “carrot and stick system” (Klang, 2008) by making it compulsory (A Swan, 2006).

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7 Carrot-and-stick system is an idiom that refers to a policy of offering a combination of rewards and punishment to induce behaviour.
Newer, smaller universities were better controlled in that the faculties and departments had not developed independently. Older and larger universities tend to be better at resisting centralized control and therefore do not quickly follow the demands of the university to adopt open access (Klang, 2008).

The second major barrier is copyright issues; authors are afraid to break the contract with the publishers and worry about intellectual property rights. Consequently, a number of institutional repositories contain only metadata without any link to the full text (Heery and Anderson, 2005; Williams, 2008). This problem is one of being able to identify the correct version to deposit in the repository; the authors did not have much control over different versions of their articles (Klang, 2008). However over 90 percent of publishers now give the green light for authors to publish (self-archive) their articles to be available to the public (RoMEO, 2009; A Sale, 2006).

Third is a lack of awareness and knowledge of the benefits of open access. This is a new topic so there is need for further advocacy and training with regards to open access. To overcome this issue, Sale (2006) explained that once a researcher has deposited one or two articles in a repository and seen the value, “they don’t look back”.

Finally, some researchers do not know how to deposit an article on the repositories. However, Swan and Brown (2005) said that the whole depositing process (enter metadata and deposit the full text file) for an article takes around ten minutes. Moreover, in the same study twenty two percent found it very easy to deposit an article, 52 percent found it easy or very easy and only four percent found it difficult. To overcome these knowledge barriers, additional training, courses and seminars were needed to educate the researchers within organisations or universities.

3.6 Summary

This chapter provided a background on digital repositories and open access. Digital repositories were defined and examples were provided. Following this, benefits and barriers of open access were discussed. The next chapter of this report will describe and discuss the development of digital repository over the past few years in New Zealand and other parts of the world, including the United States, Europe, the United Kingdom, Japan and Australia.
Chapter 4

The Development of

Digital Repositories

This chapter of the report will briefly cover the history and background of the digital repositories movement. It also discusses the development of various (institutional) digital repositories in New Zealand, as well as different countries across the world.

4.1 The Development

The amount of digitised information is increasing rapidly. The report from the white paper, The Expanding Digital Universe, published by International Data Corporation (IDC)\(^8\) finds that the estimated amount of digital information created, captured, and replicated in 2006 was approximately 161 exabytes or 161 billion gigabytes of information generated altogether, mostly by individual users worldwide (Gantz et al., 2007). The figures are surprising. “This is about 3 million times the information in all the books ever written”, Gantz, et al. claimed. Furthermore, Gantz, et al. further go on to forecast that “between 2006 and 2010, the information added annually to the digital universe will increase more than six fold from 161 exabytes to 988 exabytes”, or almost a zettabyte.\(^9\)

In parallel, according to Fayyad and Uthurusamy (2002), “The capacity of digital data storage worldwide has doubled every nine months for at least a decade, at twice

\(^{8}\) International Data Corporation (IDC) (http://www.idc.com/)

\(^{9}\) A zettabyte is equal to 1 billion terabytes or \(10^{21}\) bytes.
the rate predicted by Moore’s Law for the growth of computing power during the same period”.

4.1.1 Repository 66\(^{10}\)

The present day implementation levels of institutional repositories are rather high. There are currently two major registries of open access repositories, which are OpenDOAR (Directory of Open Access Repositories)\(^{11}\) and ROAR (Registry of Open Access Repositories)\(^{12}\). In 2001-2006, ROAR statistics showed an extreme incline in the availability of open access repositories (R. Jones et al., 2006).

Repository 66, created by Stuart Lewis of the University of Wales, Aberystwyth, presents a map of open access digital repositories across the globe. It retrieves data from ROAR and OpenDOAR, and overlays the data onto Google Maps (Lewis, 2009). According to the map, the most popular platforms for digital repositories are DSpace (380), EPrints (300), BePress (81), ETD-db (31), OPUS (25), Fedora (19), OpenRepository (12) and other repository (377).

Further reports claimed there were 1012 digital repositories holding a total of 8,915,148 items registered on Repository 66 in June 2008 (Williams, 2008). As of April 2009, there were a total of 12,744,109 items stored in 1225 repositories (Lewis, 2009). This illustrates that the momentum for building and implementing new repositories is growing quickly. Essentially, there were over 200 new repositories registered with more items being populated globally, over a six month period.

Figures 4.1, 4.2 and 4.3 show the growth of open access digital repositories worldwide from January 2000 to April 2009. The figures reveal there were a noticeable number of open access digital repositories being developed between June 2008 and April 2009. The information bar in Figure 4.1 identifies the types of repository software in use in the following maps. Note that these maps can only identify open access digital repositories that have been registered with ROAR or OpenDOAR.

\(^{10}\) Repository 66 (http://maps.repository66.org/)

\(^{11}\) OpenDOAR (http://www.opendoar.org/)

\(^{12}\) The Registry of Open Access Repositories (ROAR) (http://roar.eprints.org/)
Figure 4.1 Open Access digital repository registered in January 2000 (Lewis, 2009)

Figure 4.2 Open Access digital repository registered between January 2000 and January 2004 (Lewis, 2009)
4.2 Institutional Repository

The history of institutional repositories is relatively short with the first discipline-based repositories being implemented and launched in the early 1990s. Several successful repositories in this early period were mentioned in the seminal text: The Institutional Repository. Jones, Andrew and MacColl (2006) draw attention to ArXiv, the first and still best known repository, launched in August 1991, and widely used by physics researchers across the world. The repository itself has expanded its coverage over time to serve the needs of other disciplines. However, it has not served as a model for many other repositories, perhaps because the other early repositories were created for the needs of some specific disciplines. For example, economics has been successful with RePEc and EconPapers\textsuperscript{13}, CogPrints\textsuperscript{14} focused on cognitive physiology working papers, and PubMed Central\textsuperscript{15} was concerned with biomedical and life sciences literature (R. Jones et al., 2006).

In 2005, a survey of United States institutions observed that approximately 40 percent already had some type of institutional repository functioning, and the rest of the institutions did not have a repository currently in place but were planning to do so in the future (Lynch and Lippincott, 2005). Similarly, in the European Union,

\begin{itemize}
\item \textsuperscript{13} EconPapers (http://econpapers.repec.org/)
\item \textsuperscript{14} CogPrints (http://cogprints.org/)
\item \textsuperscript{15} PubMed Central (http://www.pubmedcentral.nih.gov/)
\end{itemize}
there were about 230 institutions with one or more digital repositories between June 2006 and February 2007, of which approximately 50 percent participated in study (van Eijndhoven and van der Graaf, 2007). In addition, there was a survey undertaken at universities in European countries in 2005, which showed every university in Germany, Norway, and the Netherlands had some kind of institutional repository operating (Davis and Connolly, 2007).

Recent reports on institutional repositories indicate the numbers of institutional repositories are constantly growing globally. Regarding the usage of the two major repository platforms, EPrints and DSpace, the use of EPrints increased from 125 to more than 200 repositories between 2004 and 2005 (Lomangino, 2006). As of April 2009, the Registry of Open Access Repositories (ROAR) indicates there are 399 known repositories using DSpace, with EPrints being the preferred software platform for 315 repositories. Furthermore, Lomangino has also claimed that the number of digital repositories which comply with the Open Archives Initiative’s (OAI) standards has grown from 243 to 617 repositories. This number has nearly tripled since late 2003 (Lomangino, 2006).

As of April 2009, OpenDOAR listed 1374 repositories. Figure 4.4 is a chart from OpenDOAR that displays the growth of the OpenDOAR database from 2006 up until April 2009.

![Growth of the OpenDOAR Database Worldwide](http://www.opendoar.org/)

**Figure 4.4** Growth in OpenDOAR list of repositories (OpenDOAR, 2009)

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16 An up-to-date version of this graph can be retrieved from [http://www.opendoar.org/](http://www.opendoar.org/)
However, note that

the shape of the chart in 2006 reflects the work of OpenDOAR rather than the growth of the number of actual repositories. A backlog of new records built up while the database was being redeveloped during mid-2006, and clearing this backlog created the step in the graph. The chart better represents the true growth in the number of repositories from 2007 onwards (OpenDOAR, 2009).

4.2.1 New Zealand Institutional Repositories

In May 2005 the New Zealand Government announced the “New Zealand Digital Strategy” which aimed to ensure that “New Zealand is a world leader in using information and technology to realize our economic, environmental, social and cultural goals” (New Zealand Government, 2005). A proposed list of content that the government aims to digitise includes (New Zealand Government, 2004):

- national heritage collections, government information, databases of scientific and technical information, scholarly journals including e-journals, and library catalogues. It also includes educational resources, Web logs, cultural and language resources, locally produced stories and histories, family photos on a Web page, and new products from the creative industries, such as interactive games.

In parallel, the National Library of New Zealand also set up a steering group made up of representatives from across the research sector to investigate the feasibility of setting up a New Zealand network of institutional repositories, as an essential research infrastructure for the digital age (Rankin, 2005). At that stage, New Zealand had no institutional research repositories in place (AHJ Sale, 2005).

OARiNZ (Open Access Repositories in New Zealand) is a project managed by Christchurch Polytechnic Institute of Technology and is funded under the Government's eLearning Collaborative Development Fund (eCDF). The project’s aim is to design and build an infrastructure to “connect all New Zealand’s digital research repositories that meet standards for interoperability and access” (Cullen and Chawner, 2008; OARiNZ, 2009). It also works to educate, promote and support New Zealand tertiary education institutions, including universities and polytechnics on open access and digital repositories, by demonstrating what is available and how to employ such technologies (OARiNZ, 2009; Williams, 2008).
Currently, as of April 2009, information available on the OARiNZ Knowledge Base Wiki\(^\text{17}\) showed that a number of New Zealand universities and polytechnics such as University of Auckland, University of Canterbury, Victoria University of Wellington, University of Otago, Canterbury Polytechnic Institute of Technology, Manukau Institute of Technology, NorthTec, and University College of Learning have established their own institutional repositories (OARiNZ, 2009). See Appendix C for additional information.

In addition, an influencing factor behind the increasing number of institutional repositories in New Zealand is the Performance Based Research Fund (PBRF) that was introduced by the New Zealand government in 2003. The PBRF is the New Zealand government’s formal tertiary institution research performance assessment, managed by the Tertiary Education Commission. Its main purpose is to encourage and reward research excellence in New Zealand’s tertiary education sector (Tertiary Education Commission, 2009). In addition, the key part of the PBRF’s evaluation process is providing access to copies of significant research outputs. That is, researchers give the evaluation committee the copies of their (four) nominated research outputs. Previously this had to be hard copy, but in future it is likely to be in electronic forms. Therefore, the digital repositories will eventually become very be important. The next PBRF round is due to take place in 2012.

The overall success for New Zealand is that all of the institutional repositories developed and implemented in the last few years held content of some description and have made a good start towards making New Zealand’s publicly funded research publicly available. As yet, the content varies between institutions. As of April 2009, there are 14 New Zealand open access institutional repositories registered with OpenDOAR (OpenDOAR, 2009).

### 4.3 Other International Institutional Repositories

#### 4.3.1 United States (USA)

In the United States, the Federal Research Public Access Act (FRPAA) of 2006 states that publicly funded research accepted for publication must be deposited in a publicly accessible repository. The National Digital Information Infrastructure and Preservation Program (NDIIPP) is a $14.9 million national digital strategy effort led by the Library of Congress. Moreover, the NDIIPP appears to be the United States’

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\(^{17}\)OARiNZ Knowledge Base Wiki (http://www.oarinz.ac.nz/oarinzwiki/)
equivalent to New Zealand’s National Digital Strategy. Its mission is to “develop a national strategy to collect, archive, and preserve the burgeoning amounts of digital content, especially materials that are created only in digital formats, for current and future generations” (Council on Library and Information Resources and The Library of Congress, 2002). In June 2008, OpenDOAR listed just over 300 open access digital repositories within the USA (Williams, 2008). As of April 2009, this count has grown to 395 open access digital repositories (OpenDOAR, 2009).

4.3.2 United Kingdom (UK)

The United Kingdom’s Joint Information Steering Committee (JISC) was established in 1993. JISC is funded by the higher education funding councils, and its aim is to support the uptake of information and communications technology in the United Kingdom’s academic environment (such as learning, teaching, research and administration) and also to provide and allocate funding for institutional repository research projects (JISC, 2009; C. Jones, 2007).

In the United Kingdom, there is also an equivalent scheme to New Zealand’s PBRF called the Research Assessment Exercise (RAE)\(^\text{18}\), which has been in place since 1986. Again this is the main reason behind the establishment of most of the institutional repositories in the UK (RAE2008, 2009).

There are a number of well-known UK national repositories that serve the UK’s higher education and research communities, by providing archives for research data. These repositories include “AHDS, CCLRC ATLAS, the NERC Data Centres, the Data Archive with the associated ESRC service, as well as the National Archives, The British Library, The National Libraries of Scotland and Wales, Northern Irish Archives and Libraries National Archive, the National Digital Archive of Datasets” (Heery and Anderson, 2005).

In addition, the leading research institutions in the UK such as the Universities of Nottingham, Edinburgh, Glasgow, Leeds, Sheffield, York, and Oxford already have employed digital institutional repositories (SHERPA, 2009).

As of April 2009, there are 109 open access digital repositories registered in OpenDOAR within the UK, showing that these are becoming popular in the academic community (OpenDOAR, 2009).

\(^{18}\) Research Assessment Exercise (RAE) ([http://www.rae.ac.uk/aboutus/](http://www.rae.ac.uk/aboutus/))
4.3.3 Japan

The National Institute of Informatics (NII) is a Japanese inter-university research institute under the Ministry of Education, Culture, Sports, Science and Technology (MEXT). Founded in 2002, its primary purpose is to create a system to facilitate the spread of scientific information to the public. “NII aims to realize the effective contributions internationally as well as to domestic society” (National Institute of Informatics, 2003).

Additionally, in 2006 to 2007, 57 Japanese universities and the NII jointly worked to develop and provide advanced infrastructure for disseminating scholarly information and to expand nationwide installation of institutional repositories. As of the 2005 academic year, there were 726 universities involved in Japan, including 87 national universities, 86 municipal universities, 553 private universities, and 4 private correspondence education colleges (Sugita and Murakami, 2007).

By April 2007, there were 40 institutional repositories running in Japan, with more than 281,000 items. Moreover, there were 11,752 full-text dissertations, 29,870 dissertation abstracts, 900 dissertation evaluation summaries and 10 master’s theses being planned for the institutional repositories. According to The NII (2003), there are 102 institutional repositories in Japan as of April 2009.

4.3.4 Australia

As in New Zealand, many universities in Australia have also employed digital repositories to make their research outputs publicly available.

Australia’s ARROW (Australian Research Repositories Online to the World) project is similar to the OARiNZ project in New Zealand. It is funded by the Australian Federal Government’s Department of Education Skills and Training (DEST), and aims to establish institutional repositories (Heery and Anderson, 2005). ARROW is currently developing and testing new software to support institutions in setting up and managing institutional repositories. ARROW offers software that enables “more creative uses of repositories and more flexible ways in which repositories integrate with other knowledge management tools” (ARROW, 2009; Pappalardo et al., 2007).

The ARROW Consortium comprises Monash University, National Library of Australia, the University of New South Wales and Swinburne University of Technology. ARROW Community members include a number of Australian Universities such as Queensland University of Technology, University of South Australia, Central Queensland University, La Trobe University and University of Western Sydney. (ARROW, 2009; Pappalardo et al., 2007)
Australia was developing a Research Quality Framework (RQF) similar to New Zealand’s PBRF, but the new government cancelled the scheme after the election in 2007 (Williams, 2008). Many Australian universities stated that the RQF was the main motivation behind their implementation of repositories (Australia Government, 2005; Organ, 2006). On 26 February 2008, the Australian government announced plans for a new research quality and evaluation system called the Excellence in Research for Australia (ERA) initiative. The system is partially based on digital repositories as it will use automated bibliometric tools for assessing the impact of scholarly research. Moreover, “It involves the scrutiny of the references contained in journal articles, including analysis of reference frequency and patterns, using the abstract and citation databases (Australia Government, 2009).

In Australia, Monash University, Swinburne University of Technology, University of New South Wales, Queensland University of Technology, University of Southern Queensland, University of Wollongong and many others have employed digital repositories to make their research outputs publicly available (ARROW, 2009; Organ, 2006; A Sale, 2006; Williams, 2008). Moreover, the National Library of Australia has also implemented its own digital repository (Williams, 2008).

As of April 2009, there are 102 Australian open access digital repositories registered with OpenDOAR, and 43 of these are institutional repositories.

### 4.4 Summary

Figure 4.5 shows a breakdown of the number of digital repositories by country, registered in OpenDOAR as of April 2009. Obviously, the United States has the largest number of repositories with 343, followed by the UK (151), Germany (132), Japan (74), Australia (62), the Netherlands, Italy (46) and Canada (44).
Moreover, ROAR has entries for institutional repositories from 64 different countries. A particular repository registered on ROAR belongs to a country if its content is submitted by users in that country. For example, an institutional repository is classified to the country in which the institution is based.

According to (ROAR, 2009), the US (160), the UK (85), Germany (56), Japan (55), Australia (29), India (26), Canada (26), Italy (22), Russia (22), Sweden (21), France (20) and the Netherlands (19) have the largest number of institutional repositories. In addition, “the Netherlands has 100 [percent] availability of research repositories in its higher-education research institutions” (Brody, 2006). See Figure 4.6 for the complete breakdown of the number of institutional repositories by countries.
The next chapter will present an overview of different common repository software platforms that are available today. These include EPrints, Fedora and DSpace. Each repository software platform will be explained in detail.
Chapter 5

Overview of Repository Software Platforms

5.1 Introduction

Digital repositories are a relatively new technology which began to gain attention around 2005. There have been many new repositories built in the past few years and repository software has been under continuous development. The landscape of software platforms for building digital institutional repositories is constantly changing. A digital repository can be built and managed around specific repository building software. For instance, the most popular and best-known open source repository platforms are Dspace,\(^{19}\) EPrints\(^{20}\) and Fedora.\(^{21}\) There are also some commercial software platforms such as Digital Commons but they have not gained the same level of recognition as the open source repository software (Burton et al., 2008). However, there are many other software options to these well-known platforms, for instance, ContentDM, Greenstone digital library, DiVA, WebWare, Internet Scout, Virginia Tech electronics and dissertation software, Sakai, WebCT, LOCKSS, WebWork, Open Source Portfolio Initiative and UPortal (Williams, 2008).

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\(^{19}\) DSpace (http://www.dspace.org/)

\(^{20}\) EPrints (http://www.eprints.org/)

\(^{21}\) Fedora (http://www.fedora-commons.org/)
5.2 Available Repository Software Platforms

In the last few years, initiatives to create software platforms for digital repository management have expanded across the world. Some institutions and organisations engage this method in order to preserve their content that might otherwise be lost, or to provide greater access to their outputs. The open access movement has been an important factor in this development. This section will give an overview of well-known repository software platforms that are popular and employed among institutions and organisations.

5.2.1 EPrints (Open Source)
**URL:** [http://www.eprints.org/](http://www.eprints.org/)

GNU EPrints is free, open source software developed at the University of Southampton and written in Perl. It is the first and one of the most widely used generic software for creating Open Access Initiative (OAI)-compliant repositories. This software enables researchers to self-archive their research publications thus facilitating open access to their publications. EPrints was created in 2000 and became available in 2001 (EPrints, 2009).

Hitchcock (2005) stated that “EPrints is quick to install, easy to configure, and needs minimal maintenance. Once installed, it simply works without fuss. There simply isn't a contest”.

Some examples of universities in Australia and New Zealand that have employed EPrints for their institutional digital repositories are: University of Otago School of Business (Otago EPrints), Victoria University (Victoria University Institutional Repository – VUIR), University of Melbourne (University of Melbourne EPrints Repository – UMER) and University of Queensland (EPrintsUQ).

5.2.2 DSpace (Open Source)
**URL:** [http://www.dspace.org](http://www.dspace.org)

The DSpace institutional repository system is open source software (written in Java) for building and managing digital repositories that went public in 2002 (DSpace, 2009). It is the development and deployment of the Massachusetts Institute of Technology (MIT) Library, created in collaboration with Hewlett Packard Corporation (HP). DSpace is freely available to institutions or research organisations.
as an open access system that can be customized and extended. Since November 2002, at least 2500 organizations have downloaded the DSpace software platform (Cervone, 2004; Shearer, 2003).

In New Zealand, the University of Auckland (ResearchSpace@Auckland), the University of Canterbury (UC Research Repository) and the University of Waikato (Research Commons@Waikato) are currently using DSpace for their institutional repositories to meet variety of digital archiving needs.

5.2.3 Fedora – Flexible Extensible Digital Object and Repository Architecture (Open Source)

URL: [http://www.fedora-commons.org/](http://www.fedora-commons.org/)

Fedora, not to be confused with the Fedora Linux distribution, is another open source repository software platform jointly developed by the University of Virginia and Cornell University. Fedora serves as a foundation for building interoperable web-based digital libraries, institutional repositories, and other information management systems. It demonstrates how an institution can deploy a distributed digital library architecture using web-based technologies, including XML and Web services (Fedora Commons, 2009). Initially, Fedora was designed as a storage management layer for digital asset management; however it does not provide the type of user interface that a typical digital repository would have. Therefore, a user would need another layer on top, such as the Fez project developed in Australia.

5.2.4 Digital Commons (Commercial)

URL: [http://www.bepress.com/](http://www.bepress.com/)

Digital Commons is the world’s leading hosted commercial repository platform; hosted by the Berkeley Electronic Press (also known as Bepress). A Digital Commons license package will include setup, training, support, documentation, upgrades, and hosting. Its repository software is used to implement and manage digital repositories for associations, business companies, universities and researchers to preserve and showcase their research output. Moreover, Digital Commons can include pre-prints, journal articles, dissertations, master’s theses, conference proceedings, and a wide variety of other content types. Content on the repository is optimized for fast and

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22 Fez is an open source project to produce and maintain a highly flexible web interface to Fedora for any library or institution to configure and publish or archive documents of any type sustainably (University of Queensland, 2008)
accurate indexing by Google, Google Scholar and is OAI compliant. Digital Commons provides user notification tools. This includes RSS feeds and automatic email notification for reports of newly published content (Berkeley Electronic Press, 2009).

For example, Canterbury Polytechnic Institute of Technology, Manukau Institute of Technology, NorthTec, UCOL: University College of Learning, Unitec New Zealand and Whitireia Community Polytechnic are institutions that are currently using Digital Common as their repositories.

5.2.5 DuraSpace (Open Source)

URL: http://www.duraspace.org/

Fedora Commons and DSpace, two of the largest providers of open source software for managing and providing access to digital content, have joined together to create DuraSpace in May 2009. DuraSpace is envisioned to be a service that acts like a mediator between institutions and a variety of third party storage service. The main goal is to provide a different level of service towards making digital content accessible for long periods of time (DuraSpace, 2009). However it is still in the implementation stage at the moment (as of May 2009).

Morris, Kimpton, and Payette (2009) claimed that “[it] will provide leadership and innovation in open source technologies for global communities who manage, preserve, and provide access to digital content”.

The next chapter of this report will introduce the School of Business EPrints digital repository, providing a background on the Otago EPrints digital repository. The facts and features of the Otago EPrints will be outlined in detail, also giving an overview of the repository workflow.
Chapter 6

About The Otago EPrints Digital Repository

6.1 Introduction

The University of Otago School of Business comprises seven departments: Accountancy and Business Law, Economics, Finance and Quantitative Analysis, Information Science, Management, Marketing and Tourism (School of Business, 2009). Together they offer students a comprehensive education in all aspects of business and commerce as well as undertaking research in many areas.

Importantly, these research outputs and scholarly publications provide intensive knowledge that can be of value to other University departments, other Universities and to individuals across the world. This knowledge should be captured and preserved in a digital repository in order to enable learning and sharing. The School of Business EPrints repository collects and stores information about the research outputs of researchers within the School of Business.

6.2 How Did It Get There?

In May 2005, two senior University of Otago staff undertook a study tour of Digital Challenges facing universities in the United States. Their report provided the immediate impetus for the School of Business project, starting on 7 November 2005, with the following goals (Stanger and McGregor, 2006):
• To establish a proof of concept demonstrator for storing and providing open access to digital research publications in the School of Business.

• To evaluate the potential for University of Otago research community.

• To connect the School of Business with the global research community.

The repository was launched on 17 November 2005, after ten days work by a small team of five people (Stanger and McGregor, 2006). This illustrates that creating and implementing an institutional repository can be cheap, convenient and takes little effort. It can be as simple as downloading open source software and installing it onto a computer on the network.

In addition, the development team set up the repository on a spare server running FreeBSD therefore the costs of hardware and software were almost zero. The development team had made use of some unused spare hardware. They claimed that it was crucial to get the repository running first and then it could be expanded at later stage (Stanger and McGregor, 2006).

The repository is running on EPrints 3.0. GNU open source software was used right from an early stage and it is serving the requirements of the institutional repository fairly well. In addition, the development team has stated it chose the open source GNU EPrints repository management software because it was quick to install, widely used, well supported, inexpensive and would not lock the School of Business into specific technology or vendors (Stanger and McGregor, 2006).

6.3 Otago EPrints: Facts & Features

Otago EPrints is considered to be New Zealand’s first publicly available institutional repository (Stanger and McGregor, 2006). It showcases the research work (both before and after peer-review) of academic staff and postgraduate students in departments across the School (Otago EPrints, 2009), providing not just metadata or abstracts but also full text of a wide range of resources - including journal articles, conference papers, preprints, theses, working papers and reports - making these articles more visible and accessible. Since its launch, the repository has been growing steadily in terms of the number of records it holds.

There were 65 conference papers in the repository when Otago EPrints was officially launched. As of 7 March 2006, there were a total of 18,744 downloads in total, from eighty different countries since the repository went live, which was less than three
months into the project (Stanger and McGregor, 2006). The content was limited to voluntary contribution in PDF format from colleagues in the School of Business, but with no constraint on the type of output.

The team has incorporated a number of value added features to the repository software, which include:

- Browsing of records by keyword
- Customization of the repository homepage metadata fields and document types
- Alphabetized listing of the organizational unit within the University and subject of the article.
- Automated notification of new items via RSS and Twitter feeds.

6.4 Otago EPrints Digital Repository Workflow

Authors may deposit their research outputs in the School of Business EPrints repository (or other repositories). In parallel, they may choose a journal or conference to which they want the paper submitted for peer-review in order to publish in the journal or conference proceedings.

The standard deposit procedure for the Otago School of Business EPrints repository is as follows (see Figure 6.1):

1. Once an author has finished their research output(s), he/she sends them to the departmental “depositor”. For example, the department may decide that any staff member from their department can be responsible for depositing items into the repository, to make it publicly available. Typically, the departmental administrator is the “depositor” and metadata editor.

2. After the departmental administrator (depositor) receives the research output(s); the following tasks are carried out to deposit a research output in the Otago EPrints repository. The depositor must:
   - Check copyright and permission; by going through the copyright agreement from the publisher, contacting the publisher or checking the SHERPA/RoMEO site for further details.
• Enter metadata into EPrints, including name of author, abstract and description, and upload the actual full-text file.
• Deposit for review; this will place the item in a holding area for review and automatically notify the library.

3. Once the Library staff are notified, and the metadata have been verified:
• The Library makes the item publicly available if there are no concerns.
• Otherwise, items that do not make it through the process (e.g., because of poor quality or copyright issues) are not archived in the repository and are returned to the depositor for corrections.

Figure 6.1 illustrates the repository workflow. The darker gray boxes are processes carried out within the EPrints software; the light gray dashed box contains tasks the department administrator or depositor must perform in order to deposit an item into the Otago EPrints repository. Dashed arrows indicate optional steps.
Chapter 7

The Otago EPrints

Usage Statistical Review

This chapter discusses the statistical review of the Otago EPrints repository, including the growth of the repository and item affiliations and item types that are currently stored in the repository since the repository went live in 2005. Downloading statistics, with respect to downloads of abstract pages and full-text documents, is also discussed. The ‘most popular’ items in the repository are also listed within this chapter.

7.1 The Current State

As of April 2009, the Otago EPrints repository held a total of 675 research outputs from the various departments in the School of Business (Accountancy and Business Law, Economics, Information Science, Marketing, Finance and Quantitative Analysis, Management and Tourism). This covers a wide range of topics and document types, with new content being continually acquired (Otago EPrints, 2009).
The School of Business digital repository is currently using a modified statistical package developed at University of Tasmania (UTas) by Professor Arthur Sale, a known and active contributor in the field of institutional repositories, and Christian McGee, to track download statistics (Stanger and McGregor, 2006; Williams, 2008). The Tasmania statistical package provides a general, almost real-time summary of activities within the EPrints repository, including:

- Number of downloads by item (abstract views and full-text downloads).
- Number of downloads by country, with the local campus (Otago Intranet) well separated from normal countries, including realistic country flags.
- Number of downloads by search engine.
- Monthly download statistics.
- List of items by access frequency over the last 4 weeks, by month or year, or in total.
- User friendly graphics and tabular data.

Note that some parts of the statistical review method in this section have been adapted and modified from a previous author study. This regards the number of

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23 Otago EPrints (http://eprints.otago.ac.nz/)
downloads and usage statistics for the institutional repository at the University of Wollongong, Australia (Organ, 2006).

Figure 7.2 shows the growth of the School of Business repository during its lifetime. It demonstrates that the number of items in the repository has been steady growing since it went live and the trend is likely to keep increasing in number of items in the future.

7.1.1 Affiliations of the Items

Affiliation is an association between a paper and some organisational unit within the University, such as a department or research group. The association may be authorship or it may be associated with something else such as inclusion in a conference run by a department. Furthermore, an item can have as many affiliations as necessary due to the collaboration of authors (that is, affiliations are not mutually exclusive). A particular paper may start out as written in parts by different authors, and then finally combining where co-authors sit together and produce a final draft. For example, if one of the paper’s authors is in the department of Accountancy and Business Law (ACCT), and the other author is in the department of Information Science (INFO), this paper will be affiliated to both ACCT and INFO - neither of which is 'more important' than the other. However, each affiliation will only appear once for each paper. For instance, if both of the authors are from the department of Information Science, INFO will only appear once.
Figure 7.3 shows a breakdown of the items within the Otago EPrints repository associated with the department. The affiliations with the most research outputs are Information Science and Economics, while the affiliation with the fewest is the Office of the Dean (which is not surprising, as it is primarily an administrative unit). According to Figure 7.3, 170 papers in the Otago EPrints repository are affiliated with the Department of Information Science, which is approximately 25 percent of all the papers stored in the repository; followed by the Department of Economics with about 21 percent (139 items); and 16 percent (108 items) for the Department of Finance and Quantitative Analysis. ‘Other’ includes departments that are not in the School of Business, such as Anatomy, Botany, Chemistry, Computer Science, Design, Geography, Geology, Mathematics, and Zoology, and accounts for about 7 percent (50 items).

7.1.2 Type of Items

Figure 7.4 and Table 7.1 show an approximate estimate and breakdown of different types of research material stored within the School of Business repository in terms of both numbers and percentages. (Note that unlike affiliations, item types are mutually exclusive.) Theses and dissertations make up just under half (45 percent) of the overall content of the repository. This could be explained by the fact that various departments in the university, including the Department of Information Science, strongly encourage students to deposit their theses and dissertations in the Otago EPrints repository. Moreover, in 2010 the university will be releasing a new policy, making it mandatory for every postgraduate student to deposit their theses and dissertations in electronic versions for inclusion in the repository. Furthermore, the second largest category is discussion/working papers, most of which were already
available on departmental web sites. The ‘Other’ category refers to material such as book sections and standalone presentations.

Table 7.1 Types of Items in the Otago EPrints Repository, as of April, 2009

<table>
<thead>
<tr>
<th>Type</th>
<th>Number of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Journal</td>
<td>20</td>
</tr>
<tr>
<td>Conference</td>
<td>105</td>
</tr>
<tr>
<td>Thesis/Dissertation</td>
<td>290</td>
</tr>
<tr>
<td>Working/Discussion</td>
<td>183</td>
</tr>
<tr>
<td>Other</td>
<td>49</td>
</tr>
</tbody>
</table>

Figure 7.4 Graph Illustrating Types of Items in the Otago EPrints Repository by Percentage, as of April, 2009

7.2 Download Statistics

The locally-modified version of the statistics package developed at the University of Tasmania is used to track the number of downloads of papers from the repository.

As of April 2009, the statistics show that the School of Business repository had logged 669,312 abstract page views from 201 distinct countries and 303,272 full-text downloads from 201 countries since the repository went live.

According to the development team, the huge amount of traffic generated in the repository’s early period is due to the following reasons (Stanger and McGregor, 2006):
• Otago’s research reputation
• The reputation of individual authors
• Otago EPrints being the first institutional repository to become publicly available in New Zealand
• The relative rarity of business schools with institutional repositories and;
• Good rankings in search engines such as Google

7.2.1 Monthly Downloads

The Tasmania statistical package has the capability to calculate the number of full-text downloads of individual items, as well as the number of hits on the corresponding abstract page. The statistics can be further broken down by the last 4 weeks, month or year. It also provides a statistical summary page for each individual item, allowing the authors to monitor the hits and download rates for their own items.

Table 7.2 and Figure 7.5 show the actual monthly total number of abstract views and full-text downloads. As seen in Figure 7.5, both the numbers of abstract views and full-text downloads have been generally rising over the years since the repository has been established and it seems likely this trend will continue. It clearly illustrates that the age of the repository is perhaps a factor in the number of downloads generated. This demonstrates that users are willing to select and retrieve research outputs from the Otago EPrints directly or via the search engines. This also suggests there is some level of public interest in the University of Otago’s research outputs.
Table 7.2 Monthly abstract views and full-text downloads between November 2005 and March 2009

<table>
<thead>
<tr>
<th>Month and Year</th>
<th>Number of Downloads</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Abstracts</td>
<td>Full-Texts</td>
<td></td>
</tr>
<tr>
<td>November 2005</td>
<td>402</td>
<td>233</td>
<td></td>
</tr>
<tr>
<td>April 2006</td>
<td>7,975</td>
<td>4,050</td>
<td></td>
</tr>
<tr>
<td>September 2006</td>
<td>13,797</td>
<td>7,412</td>
<td></td>
</tr>
<tr>
<td>February 2007</td>
<td>8,857</td>
<td>5,716</td>
<td></td>
</tr>
<tr>
<td>July 2007</td>
<td>18,043</td>
<td>7,482</td>
<td></td>
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<tr>
<td>December 2007</td>
<td>19,295</td>
<td>6,375</td>
<td></td>
</tr>
<tr>
<td>May 2008</td>
<td>21,536</td>
<td>9,652</td>
<td></td>
</tr>
<tr>
<td>October 2008</td>
<td>36,078</td>
<td>14,685</td>
<td></td>
</tr>
<tr>
<td>March 2009</td>
<td>31,639</td>
<td>18,094</td>
<td></td>
</tr>
</tbody>
</table>

Figure 7.5 Monthly abstract views and full-text downloads between November 2005 and March 2009
7.2.2 Full-text Downloads vs. Abstract Views

As shown in Figure 7.5 above, the repository experiences more abstract views than full-text downloads. This could, possibly, be explained by the fact that both abstract pages and full-text documents get indexed by search engines, and when a user searches via a search engine the abstract pages are usually listed before its associated full-text in the search results (see Figure 7.6 for an example). Users are most likely to click the link which is listed first on the results page.

Pan, Hembrooke, Joachims, Lorigo, Gay and Granka (2007) investigated user behaviour with regard to their use of the Google search engine by using eye movement tracking. They claimed that users’ decisions were “strongly biased towards” links listed earlier in the search results page, even when these links were less relevant. As shown in Figure 7.7, they found that “subjects viewed the two top-ranked abstracts with the highest frequency and clicked on the number one abstract most of the time” (Pan et al., 2007). A study by Granka, Joachims and Gay (2004) also found similar results.
Another reason could be that the users tend to select the abstract page first, in order to get an overall idea of what the full-text covers.

It should be noted that two other institutional repositories currently using EPrints also generate similar hit rate statistics (abstract views being lower than full-text downloads). These were the University of Arizona\textsuperscript{24} and the University of Tasmania.\textsuperscript{25}

The statistical package can also generate a ranked list of the most popular items, that is, items with the highest number of downloads and abstract page views. The top eleven downloaded items for the period between November 2005 and April 2009 are listed in Table 7.3, in regard to the number of full-text downloads (of the PDF) and abstract page views. The figures in brackets represent the relative ranking in each category.

Table 7.3 illustrates there is no “definitive correlation” between abstract views and full-text downloads in any way (Organ, 2006). For instance, the article ‘Hitting the ground running: building New Zealand’s first publicly available institutional repository’ (the last item in Table 7.3) ranks number 11 in terms of full-text downloads, but ranks first in terms of abstract views.

On the other hand, ‘Total quality management, sustainable competitive advantage, and the resource-based view an exploratory study of TQM and competitive advantage at Fisher & Paykel’ (the first item in Table 7.3) ranks number 1 in full text downloads, but there are only 3,174 in abstract page views. This indicates the possibility that primary access to the document may be via the PDF once it is

\textsuperscript{24} DLIST (http://dlist.sir.arizona.edu/)

\textsuperscript{25} UTas EPrints (http://eprints.utas.edu.au/)
discovered by search engines. However, this is difficult to confirm due to the number of possibilities in the search and discovery process.

Table 7.3 Otago EPrints – Top 11 full-text downloads and abstract views between November 2005 and April 2009

<table>
<thead>
<tr>
<th>Title</th>
<th>Full text downloads</th>
<th>Abstract Views</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total quality management, sustainable competitive advantage, and the resource-based view an exploratory study of TQM and competitive advantage at Fisher &amp; Paykel</td>
<td>5,742 (1)</td>
<td>3,174 (2)</td>
</tr>
<tr>
<td>Radio frequency identification (RFID)</td>
<td>4,706 (2)</td>
<td>2,397 (10)</td>
</tr>
<tr>
<td>Nurse burnout in a high stress health care environment: prognosis better than expected?</td>
<td>4,366 (3)</td>
<td>1,915 (19)</td>
</tr>
<tr>
<td>Political marketing and political communication: the relationship revisited</td>
<td>4,166 (4)</td>
<td>1,510 (54)</td>
</tr>
<tr>
<td>Wine tourism and the generation Y market: any possibilities?</td>
<td>3,604 (5)</td>
<td>2,021 (15)</td>
</tr>
<tr>
<td>MatLab/database connectivity</td>
<td>3,174 (6)</td>
<td>1,703 (30)</td>
</tr>
<tr>
<td>Lobbying and public affairs in the UK: The relationship to political marketing</td>
<td>3,060 (7)</td>
<td>2,150 (13)</td>
</tr>
<tr>
<td>Towards business excellence: aligning total quality management and information technology management</td>
<td>3,015 (8)</td>
<td>1,968 (17)</td>
</tr>
<tr>
<td>Signal processing and acoustic modelling of speech signals for speech recognition systems</td>
<td>2,749 (9)</td>
<td>1,173 (156)</td>
</tr>
<tr>
<td>Terrorism, tourism, and the issue attention cycle: An exploratory and longitudinal investigation of student perceptions of travel to the US post September 11</td>
<td>2535 (10)</td>
<td>1666 (32)</td>
</tr>
<tr>
<td>Hitting the ground running: building New Zealand’s first publicly available institutional repository</td>
<td>2,453 (11)</td>
<td>6,751 (1)</td>
</tr>
</tbody>
</table>

As of April 2009, only 1.19 percent of the uploaded research outputs had more than 3000 full text downloads, while about half (50.67 percent) fell within the 1–500 full-text download range (see Table 7.4 below). For abstract views, over half fell into the 501–1,000 range (59.70 percent). Note that none of the items in the Otago EPrints repository has zero abstract views or full text download, probably because each item
will have been harvested and indexed by search engines shortly after it was first uploaded into the repository.

Table 7.4 Spread of Downloads, November 2005 – April 2009, Otago EPrints

<table>
<thead>
<tr>
<th>Number of downloads</th>
<th>1-500</th>
<th>501-1000</th>
<th>1001-1500</th>
<th>1501-2000</th>
<th>2001-2500</th>
<th>2501-3000</th>
<th>3000+</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Full text downloads</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of items</td>
<td>342</td>
<td>127</td>
<td>47</td>
<td>11</td>
<td>5</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Percentage (%)</td>
<td>50.67</td>
<td>18.81</td>
<td>6.96</td>
<td>1.63</td>
<td>0.74</td>
<td>0.44</td>
<td>1.19</td>
</tr>
<tr>
<td><strong>Abstract views</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of items</td>
<td>73</td>
<td>403</td>
<td>209</td>
<td>44</td>
<td>7</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Percentage (%)</td>
<td>10.81</td>
<td>59.70</td>
<td>30.96</td>
<td>6.52</td>
<td>1.04</td>
<td>0.89</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Search engines such as Google and Yahoo! are highly significant research tools for students and academic researchers at all levels, offering the ability to have their research outputs discovered in a quick and efficient manner (Organ, 2006; Schmitz, 2008). Moreover, they are considered to be a primary access and referral point. Organ (2006) claimed that 95.8 percent of the measurable full-text downloads in the repository investigated were generated from Google, with a slightly lesser percentage for abstract views (cover-page downloads). Organ (2006) further concluded that “the important role Google plays in the research and discovery process has become apparent... the dominance of Google is the most likely universal” for repository software platforms such as EPrints and DSpace.

While processing the download statistics it was observed that a large proportion of the downloads were from the United States, followed by New Zealand, the United Kingdom, India, Australia, China, Malaysia, Canada, Switzerland, etc.
In regards to the School of Business digital repository, as of April 2009, of the 303272 full text downloads of repository content in total, 184,513 (60.8 percent) were referrals from identifiable countries. Note that the countries are identified by mapping IP addresses to physical locations, through a process known as geolocation. This is not particularly accurate, as it relies on a large database that links IP addresses to locations, which is constantly changing.

For instance, there were 30,138 referrals from the United States, 22,818 from New Zealand and 16,223 from the United Kingdom, with a total of 200 other distinct countries listed in the statistics provided. The remaining 118,759 full text downloads were referrals from search engines such as Yahoo! (44,489), Google (35,678), and Windows Live Search (22,047). See Figure 7.9 below.

On the other hand, 195,809 abstract views (29.3 percent) were referrals from identifiable countries. Of these, 37,732 referrals were from the United States, followed by New Zealand with 23,628 referrals, with a total of 201 distinct countries listed (see Figure 7.8 above). The remaining 473,503 abstract views were referrals from search engines.

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26 Geolocation is the identification of the real-world geographic location of an Internet-connected computer, mobile device or website visitor.
As of April 2009, the School of Business digital repository was also harvested by metadata aggregators such as DOAR, ROAR, KRIS, OAIster and OARiNZ. These sites are not included in the statistics shown above, however, because they harvest metadata directly using the OAI-PMH protocol rather than by crawling the abstract pages and PDFs. The next chapter outlines and discusses the methodology used behind this research.
Part II

Author Study
Chapter 8

Methodology

8.1 Introduction

This chapter details the methodology used in this research. The objective of the study described in this section is to identify the authors’ perspectives, concerns, attitudes, and their awareness and use of the School of Business digital repository. It will also evaluate the impact the School of Business digital repository may have had on authors within the School of Business. It is hypothesised that departments and students do not have strong knowledge of or opinions about the School of Business digital repository.

Perceptions about open access and the acceptance of and attitude towards institutional repositories are important to the future development of the School of Business repository. The key purpose of the report is to provide the School of Business with a greater understanding of the attitude and concerns of the authors who deposited their research outputs in the School of Business digital repository, and to identify the issues that may either encourage or discourage authors from depositing their research output in Otago EPrints. The report is not intended to take a full statistical analysis but rather to gain a broad understanding of the effect of the repository within the School of Business.

8.2 The Interview Process

At the beginning of April 2009, 130 invitations were sent to authors who had research outputs in the School of Business digital repository, including academic staff and postdoctoral and postgraduate students who were currently available on campus
at Otago. A list of potential participants was created by cross-referencing a list of every author in the repository with the University of Otago staff phone list and other publicly available lists of staff and students from the likes of departmental websites and the student webmail address book. Each potential participant was then contacted by either email or phone to assess their availability and to invite them to take part in a face-to-face (personal) structured interview.

### 8.3 Questionnaires & Open Ended Interview

The views of participants were obtained using a structured open-ended interview. Before each interview, participants were required to read the information sheet attached to the questionnaires. The participant was also informed they could withdraw from the study at any time. A consent form was attached, which participants signed to indicate their agreement to participate in the study.

The interview was relatively short and structured around authors’ experiences with the School of Business digital repository. Participants were first asked to complete a questionnaire and then take part in a short interview. Most of the interviews took less than half an hour.

Despite that a personal interview can be very time consuming it is an excellent method of gathering information. The advantage of an open ended interview is that the response rate is often better when compared to an online survey and participants have the opportunity to express themselves and their perceptions in their own words.

### 8.4 Design of Question for the Questionnaires

Ethics approval was sought and obtained from the Head of the Information Science Department and the University of Otago Ethics Committee. After ethical approval was obtained the questionnaires were then prepared.

The questionnaire is made up of a total of 13 closed and open answer questions; with some questions having a number of sub-sections within them. The questionnaire was designed to be short but comprehensive enough to complete within 10 - 15 minutes.

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28 University of Otago phonebook Search
(http://www.otago.ac.nz/phonebook/search.html)
before the interview with the participant. Some questions used in this study were formulated in collaboration with Dr Nigel Stanger (one of the Otago EPrints development team), while others were modified for the local context from previous author studies on open access publishing and institutional repositories, notably Allen (2005), Bates, Loddington, Manuel, and Oppenheim (2007), Rowlands, Nicholas and Huntingdon (2004), Swan and Brown (2003), (2004), (2005) and Watson (2007). These have suggested interesting guidelines in designing the wording of questions. The questionaries used in this study consisted of thirteen questions (see Appendix F) which were divided into six sections as listed in Table 8.1. The reasons behind each question will be explained in the next section.

Table 8.1 The six sections of the interview questions

<table>
<thead>
<tr>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>About you</td>
</tr>
<tr>
<td>Awareness of School of Business EPrints Repository</td>
</tr>
<tr>
<td>Your reasons for publishing in School of Business EPrints Repository</td>
</tr>
<tr>
<td>Your experience of publishing in an online digital repository</td>
</tr>
<tr>
<td>Your opinion and concerns about digital repository</td>
</tr>
<tr>
<td>Others</td>
</tr>
</tbody>
</table>

The questionnaire was the main source of data for this study supplemented by the interviews. The questionnaire was found by participants to be easy to understand.

Personal information such as names, departments and general information such as whether the participant is staff (junior or senior) or a student was also collected for data management purposes and stored separately from the interview transcripts.

The answers and outcomes provided by the interviews were used to assess the overall impact of the repository on authors within the School of Business. They were also used as the basis to support the initial conclusions. The other data collected from the questionnaires were used to build a statistical profile within the School of Business. At the end of the interview process all the data were collated and analysed. Participants’ responses were compared and similar answers were grouped based on the data rather than on the interviewer’s personal opinions. From this, the final conclusions were made; personally identifiable data was destroyed once the research was completed.

Appendix F includes the full questionnaire.
8.5 Justification of Questions

This section will give a brief justification of the questions that were asked in the questionnaires.

8.5.1 Section 1: About you

Section 1 (Question 1 – 3) are demographic questions in which the participant’s name, associated department and status were sought. The demographic data was used in the correlation of data.

**Question 1:** Name of the Author

**Question 2:** At the time you were working on your research, in which of the following Departments in the School of Business did you work for?

**Question 3:** Which option best describes you? (Academic staff [i.e., senior or junior], Postgraduate student, Research Assistant or Other)

The department and status of participants were collected in order to reveal if there were any differences between various departments. Author names were collected for data management purposes only.

8.5.2 Section 2: Awareness of School of Business EPrints Repository

Section 2 (question 4 and its sub-questions) focused on author awareness of the School of Business digital repository. The questions gave a general overview of the participant’s awareness and knowledge about the repository.

**Question 4:** Are you aware of the School of Business EPrints Repository?

**Question 4a:** Are you aware of any of your research outputs (articles, technical reports, etc.) being made available in the School of Business EPrints Repository?

**Question 4b:** Do you know how many of your research outputs (either alone or with co-authors) are available in the repository?

**Question 4c:** What types of research output are they?
As the School of Business EPrints repository has now been running for more than 3 years (since November 2005), question 4 examined whether participants were currently aware of the School of Business EPrints repository and its contents. Initially, most of the depositing processes, including scanning, metadata entry, and uploading the full text into the repository, was completed by the development team. Therefore it was interesting to discover whether authors could identify the number and type of their research outputs stored in the Otago EPrints repository. Note that sub-questions 4a, 4b and 4c are only relevant if the participant answers “yes” to question 4.

8.5.3 Section 3: Your Reasons for Publishing in the School of Business EPrints Repository

Section 3 focuses on the reasons the author had for making their research outputs publicly available. Previous studies (A. Swan and Brown, 2005; Watson, 2007) have shown the main reason authors deposit their research outputs in open access digital repositories is to increase the visibility of their work. This section of the questionnaire investigated whether this is so for authors within the School of Business. Question 4g asked the participants whether they were willing to submit their research outputs to the repository in the future, in order to investigate the level of support for the repository from authors.

**Question 4d:** Have you noticed increased citations or contact from other researchers as a result of making your work available through the School of Business Repository?

**Question 4e and 4f:** Have you ever directly requested that one or more of your research outputs be included in the repository? What are the reasons for doing so?

**Question 4g:** Would you be more likely in the future to submit your research outputs to the School of Business Repository as a result of your experience?

8.5.4 Section 4: Your Experience of Publishing in an Online Digital Repository

Section 4 investigated the experience of authors regarding publishing in online repositories and also the location(s) that authors preferred to make their research outputs publicly available.
Question 5: Have you ever made any of your research outputs available in any other online digital repository or web site?

Question 6  Given the option, would you prefer to make your research outputs available through: (Personal web site, Departmental web site, Social Science Research Network, or Others)

Authors initially made their work freely available on the internet by making it available on web sites, either personal web sites or those provided by University departments, or through some other open access repository such as Social Science Research Network (SSRN). According to a previous study by Antelman (2004), in a sample of 2,000 papers published from 1999 to 2002 across four disciplines, forty percent of the papers were open access, and half of those were found on authors’ personal web sites. It seems to be a trend that many authors deposit their papers on their own personal web sites or departmental web sites. Questions 5 and 6 investigated whether authors at the University of Otago posted their research outputs elsewhere, outside the School of Business EPrints repository.

8.5.5 Section 5: Your Opinion and Concerns about Digital Repositories

Question 7: The University of Otago is planning to create a digital repository for PBRF-eligible (i.e. quality controlled) research outputs. Would you be interested in using such a repository when it becomes available?

The University of Otago is planning to implement a new digital repository for PBRF-eligible research outputs which will run parallel with the current EPrints repository. This repository is in the planning process at the moment and to provide the division some insight on this plan it is important to investigate the number of interested participants.

Question 8: The School of Business repository currently contains a wide range of material, both refereed and non-refereed, from both academic staff and postgraduate students. What kinds of material do you feel might be appropriate to store in an institutional digital repository?

Authors may prefer to deposit their research outputs in a variety of publication types and formats. Therefore, it is important to know what publication types or file format of their research outputs they think would be appropriate to store in the School of Business digital repository. This will give the School of Business an overview of the kind of publication types and file formats that should be included in the repository in the future. Note that question 8 is an open ended question.
Question 9: What concerns would you have about making your research outputs available in a digital repository (both refereed outputs such as journal articles and non-refereed work that may later develop into a journal publication or similar)?

Question 10: What format do you prefer for the research outputs?

Question 9 is also an open-ended question, thus the authors can express their concerns and justify their answers. Previous studies at Universities in other parts of the world have identified the major concerns (e.g. copyrights from the publishers and intellectual property rights) with regards to publishing research outputs in institutional repositories (A. Swan and Brown, 2005). This question aimed to see whether staff within the School of Business had similar concerns and trends.

Consequently, it was important to find out clearly whether authors had any concerns that might discourage them from making their research outputs available in an online digital repository, or if they had any conditions they would like to address in order to make their research outputs publicly available. By directly asking the participants, overall concerns relating to authors at University of Otago can be identified regarding the deposit of research outputs on an online digital repository. This valuable information can be used to help the design of future advocacy for the School of Business.

8.5.6 Section 6: Others

Question 11: Do you know what Open Access is with regards to research outputs?

Question 12: In your own field, approximately how many Open Access journals are you aware of?

Question 13: Are you aware that many of the research outputs in the School of Business Repository are open access (publicly available full text)?

Previous knowledge about open access would indicate that an individual understands the principles behind its use. This would provide a very good outcome, as those who are knowledgeable would probably have a better understanding of the benefits that an open access repository would introduce.

8.6 Analysis Method

Microsoft Excel was used for all analysis in this study to calculate the percentages and to conduct various graphs and charts. Moreover, there is no correct method to deal with the missing data. If inputting missing data, it will influence the final results
and will affect the overall conclusion. Only relevant questions will be used to conduct the analysis. The full details of the results and analysis will be covered in the next chapter.

Again, this research is not intended to perform a full statistical analysis; rather it tries to identify obvious trends in the data collected in order to provide an overview of the current status of knowledge regarding open access and the Otago EPrints repository.

Chapter Eight has described the methodology used for this study and gives a justification for each question. The next chapter will highlight the participant rate as well as the findings of the questionnaires and interviews.
Chapter 9

Findings, Results & Discussion

9.1 Introduction

This chapter details the findings from the interviews. Descriptive statistics summarise the raw findings of an author study at the University of Otago. Each finding is supported by literature and, where available, participants’ questionnaires and results. In addition, where appropriate, participant comments are used to highlight the findings.

More additional comments, categorized by theme, are listed in Appendix G.

9.2 The Participants

Emails, inviting individuals to take part in this study, were sent to 130 authors, including staff and postgraduate and postdoctoral students at the University of Otago. Forty people agreed to take part in a structured face-to-face interview, giving a positive participation rate of 31 percent.

Note that in all the tables in this chapter, the figures refer to the number and percentage of participants in that particular category. Where some figures do not exactly add up, this is due to rounding of percentage points.
9.3 Basic Information and Profiles

The participant profiles are shown in Table 9.1 and Figure 9.1 where the participants are broken down by department respectively. Figures in the table are the percentage of participants and are rounded.

Table 9.1 Percentage of participants by Department

<table>
<thead>
<tr>
<th>Department</th>
<th>Percentage of total participants (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accountancy and Business Law</td>
<td>5</td>
</tr>
<tr>
<td>Economics</td>
<td>15</td>
</tr>
<tr>
<td>Finance and Quantitative Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Information Science</td>
<td>50</td>
</tr>
<tr>
<td>Management</td>
<td>5</td>
</tr>
<tr>
<td>Marketing</td>
<td>15</td>
</tr>
<tr>
<td>Tourism</td>
<td>8</td>
</tr>
</tbody>
</table>

Q2: At the time you were working on your research, in which following department in the School of Business did you work for?

Figure 9.1 A breakdown of percentages of participants by department
At the time you were working on your research, in which following department in the School of Business did you work for?

![Graph showing distribution of participants by department](image)

Figure 9.2 Number of participants by department

The main participant target group (80 percent) was academic staff, which may include lecturers, senior lecturers, associate professors and professors. Figure 9.2 shows that the highest proportion participant samples were from the Department of Information Science (20 participants), and the lowest were from the Department of Finance and Quantitative Analysis (1 participant). Consequently, the spread over the departments will allow for trends to be identified.

A possible reason for the Department of Information Science sample containing many more participants may be that a major proportion of the research outputs currently stored in the repository are affiliated in some way with that department (as shown in Figure 7.3 in Chapter 7).

The participants who agreed to take part in this study were from a variety of different academic departments and research fields. Among those participants were early adopters, identified as participants who had already deposited a relatively high number of research outputs into the Otago EPrints repository. The participants comprised 32 academic staff, 2 research (postgraduate and postdoctoral) students, 4 general staff, one undergraduate student and a research assistant.

The employment status of the participants is shown in Table 9.2 and can be seen to have a distribution across the categories. The ‘Research student’ participants included postgraduate and postdoctoral students, and the ‘Other’ participants category included general staff, academic related individuals and undergraduate students.
Table 9.2 Percentages of participants’ employment status

<table>
<thead>
<tr>
<th>Participant’s employment status</th>
<th>Percentage of total participants (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Staff</td>
<td>80</td>
</tr>
<tr>
<td>Research Student</td>
<td>5</td>
</tr>
<tr>
<td>Research Assistant</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 9.3 Employment status of participants

9.4 Awareness and Use of Otago EPrints

It is crucial to collect more information about participants’ knowledge and understanding of the Otago EPrints repository. The next few questions in the questionnaire investigated this in more detail. The participants were asked about their current awareness and use of the School of Business digital repository. The participants were asked whether they are aware that the research outputs stored in the Otago EPrints repository are available in full text.
At the early stage, most of the deposit and data entry process was done by the development team. Therefore the authors of the research outputs themselves may or may not have been aware that their work was currently stored in the repository. Interestingly, awareness of the School of Business repository seems to be reasonably high, with almost all (93 percent) of the participants stating that they have heard of the Otago EPrints repository.

The next question in the questionnaire investigated how many participants were aware that their research was stored in the Otago EPrints digital repository. Only 68 percent (27 participants) said that they knew that their research outputs are currently available through the School of Business EPrints repository.

For example, one participant said that “I know the repository has existed but I have never checked to see whether my papers are there or not”. This shows that hearing and knowing about the School of Business digital repository does not necessarily encourage authors to engage with or use the repository, nor does it equate to understanding its purpose. Therefore, there appears to be a need for further advocacy to increase the awareness of Otago EPrints and knowledge about its purpose. However, there has been partial success in advocacy, as the majority of the participants knew of Otago EPrints, even if they did not know what it represented.

Table 9.3 Length of time participants have been aware of the Otago EPrints repository

<table>
<thead>
<tr>
<th>Q4: How long have you been aware of the School of Business EPrints repository for?</th>
<th>Percentage of total participants (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration</td>
<td></td>
</tr>
<tr>
<td>1 year</td>
<td>13</td>
</tr>
<tr>
<td>2 - 3 years</td>
<td>43</td>
</tr>
<tr>
<td>More than 3 years</td>
<td>30</td>
</tr>
<tr>
<td>Unsure how long</td>
<td>8</td>
</tr>
<tr>
<td>Never been aware of Otago EPrints</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

As mentioned above, as of May 2009 the School of Business has been running for about 3.5 years (since November 2005). According to Table 9.3, the majority of the participants (43 percent) were aware that the EPrints repository has been active for
2 to 3 years, while thirty percent said they had been aware for more than 3 years, and 8 percent were unsure how long they had been aware for.

The participants who were aware that at least one of their research outputs was available in Otago EPrints were then asked whether they could estimate how many of their research outputs were currently stored in Otago EPrints, and identify the types of these research outputs.

Table 9.4 Number of research outputs per “aware” participant

<table>
<thead>
<tr>
<th>Q4b: Do you know how many of your research outputs (either alone or with co-authors) are available in the repository?</th>
<th>Number of participants</th>
<th>Percentage of participants (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3</td>
<td>9</td>
<td>33</td>
</tr>
<tr>
<td>4-7</td>
<td>6</td>
<td>22</td>
</tr>
<tr>
<td>8-10</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>More than 10</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Not sure</td>
<td>7</td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
<td>27</td>
<td>100</td>
</tr>
</tbody>
</table>

According to Table 9.4, about a quarter of the “aware” participants (26 percent) were not sure of the number of their research outputs available in Otago EPrints. A third thought that they had 1–3 research outputs in Otago EPrints, followed by 22 percent with 4–7 research outputs, 11 percent with 8–10, and only 8 percent thought they had more than 10 research outputs. Moreover, the participants were then asked to identify the type of research outputs. Predictably, almost all the “aware” participants (24 out of 27) were able to identify the types of their research outputs (Table 9.5). Note that a participant could choose more than one type of research output, so the percentages shown do not sum to 100.
Table 9.5 Research output by type (identified by “aware” participants)

<table>
<thead>
<tr>
<th>Number of participants</th>
<th>Percentage of participants (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Journal Articles</td>
<td>5</td>
</tr>
<tr>
<td>Conference Papers</td>
<td>13</td>
</tr>
<tr>
<td>Technical Papers</td>
<td>8</td>
</tr>
<tr>
<td>Working Papers</td>
<td>9</td>
</tr>
<tr>
<td>Theses/Dissertations</td>
<td>5</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
</tr>
<tr>
<td>Not sure</td>
<td>2</td>
</tr>
</tbody>
</table>

**Q4c: If you KNOW how many research outputs, what types of research output are they?**

9.4.1 Level of use of Otago EPrints

Having determined the understanding and awareness of Otago EPrints, the next question related to participants’ use of the Otago EPrints repository: *Have you ever directly requested that one or more of your research outputs be included in the repository? (Q4e)*

Interestingly, of the 27 participants aware that their research outputs were currently stored in the Otago EPrints, just over a third (37 percent) said they had directly requested at least one of their research outputs to be included in the School of Business digital repository, therefore 63 percent had never requested any of their research outputs be deposited. Essentially, this demonstrates that even though authors are aware that the repository exists, this does not mean that all authors will automatically begin depositing their research outputs for inclusion.

9.4.2 Reason for publishing in Otago EPrints

Those participants who answered “yes” to question 4 were then asked: *What were your reasons for doing so? (Q4f)* The participants were able to mention more than one reason. Of the 10 participants who had directly requested research outputs to be included in the repository, 8 participants cited the reason as potential for increasing the visibility of their research outputs, 5 cited dissemination of their research outputs and to share their findings with other researchers, 2 said that it was
to be research active for PBRF submission and one participant said the reason was “to date the work and to cite another paper”.

As mentioned, half of the participants gave “dissemination of research outputs” as their reason; this clearly demonstrates that participants saw their research outputs as the most important means of dissemination. However, a few participants used the repository as a “PBRF submission”; this also indicates PBRF has a positive bias towards refereed journal articles. It is not surprising that this positive attitude infuses some of the participants.

As this question is open-ended, a range of reasons have been provided. A majority of the reasons relate to providing greater visibility, access to individuals across the world and dissemination of their work. A number of participants provided additional comments, some of which are reproduced below:

This will improve the visibility of my articles. Access to current and relevant literature will be readily available to other researchers locally and internationally. This should lead to higher quality research and publications...

I have requested to put my research output in 2005 – the reason for it was to beat the PBRF deadline. That’s the main purpose I saw in the system...

The questionnaire then asked all participants whether, based on their experience, they would be more likely in future to submit their research to the School of Business EPrints repository. This was to test the participants’ attitude towards open access.

Figure 9.4 Willingness of participants to submit research outputs in future
Of 40 participants, 65 percent (26 participants) said they would be more likely to submit their research outputs to the School of Business EPrints repository, 30 percent (12 participants) said they would be unlikely to submit their research outputs in the repository and the remaining 5 percent (2 participants) said either they did not know or have not yet decided. Some participants have never contributed their research outputs to Otago EPrints. Others expressed their intention to continue contributing in the future, while others believed their research outputs can be better deposited in another location, such as a well-known repository. Figure 9.4 illustrates the large difference between those are willing to submit their research outputs to the repository and those who are not.

9.4.3 Reason for not publishing in Otago EPrints

The interview also further investigated the reasons why participants might not submit their research outputs to the School of Business digital repository. Most of the reasons are associated with personal factors (including lack of awareness or knowledge about the benefits of open access; many had not realised that others might want their research outputs), internal factors (lack of knowledge of how to deposit research outputs in the repository), and intellectual property and copyright issues.

A number of participants provided additional comments, some of which are reproduced below:

I'm not sure what the benefits would be...

I'm not sure exactly how to submit a research output into the repository, and I don’t even know how those research outputs that I have in the repository got in the repository in the first place.

I do not think that a lot of people will look up the School of Business digital repository expecting to find much economics stuff from there because it is called ‘business’... so I suspect most people look at the repository expecting to see stuff about business and most of what we [Economics] do has nothing to do with business...

At the end of the interview, participants who were not willing to submit their research outputs in Otago EPrints in the future were shown download statistics for one of their research outputs from the EPrints statistics page (Appendix H). All of them were thrilled by the number of people who have been retrieving their paper and a few of them subsequently said they were willing to deposit their research outputs to Otago EPrints in the future.
One of the questions asked the participants: *Given the option, would you prefer to make your research outputs available through the School of Business EPrints repository, some other online digital repository or web site, including departmental and personal web sites.* The results were very promising as all participants preferred to make their research outputs available through at least one option (see Table 9.6). Again, these options are not mutually exclusive, so participants could choose more than one.

**Table 9.6 Participants’ preferred location(s) to publish research outputs**

<table>
<thead>
<tr>
<th>Q6: Given the option, would you prefer to make your research outputs available through:</th>
<th>Number of participants</th>
<th>Percentage of participants (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>School of Business EPrints</td>
<td>28</td>
<td>70</td>
</tr>
<tr>
<td>Some other online repository</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>Web site (personal or departmental)</td>
<td>16</td>
<td>40</td>
</tr>
</tbody>
</table>

The majority of participants (70 percent) preferred to deposit research outputs in the School of Business digital repository. Forty percent said they would like to make research outputs available in a personal or departmental web site, and 20 percent preferred to place their outputs in another online repository.

Some participants noted that the main reason they would prefer to place their research outputs on a personal web site was “ease of management”. For example:

I don’t actually mind if my research outputs are on the repository. The only thing I can think of is that if I have to move somewhere else to another institution – the personal web site will still be with me and most of my papers are already there. It’s more of a management purpose…

Several participants who preferred to make the research outputs available through the School of Business repository gave reasons such as: central point of access, better visibility, higher rankings in search engines and the popularity of Otago EPrints.

A number of participants provided additional comments, some of which are reproduced below:

I prefer Otago EPrints as a central point of access rather than having research outputs stored at different locations.
Because it is used by other researchers and the public across the globe, so the visibility of the articles through EPrints would be better...

[Otago EPrints digital repository] seems to appear higher in Google search results and is also indexed by other services.

For example, our department website has a list of the publications such as journal articles and working paper series and there could be link to the Otago EPrints repository.

The results in this section clearly demonstrate that participants reveal willingness and enthusiasm in regard to submitting their research outputs to be made publicly available in an online digital repository or website. However, it is very easy for them to remain detached from the Otago EPrints repository. Further research is needed to find out ways of engaging the authors in a sensible way.

9.5 Impact on Citations and Feedback

9.5.1 Participants’ citation records, contacts and feedback

The next question is a yes/no question: *Have you noticed increased citations or contacts from other researchers as a result of making your work available through the School of Business Repository?* As discussed in Chapter 2, one potential benefit of open access is to increase citation rates. This question investigated whether authors have had increased citations or contact as a result of making their research outputs available in the Otago EPrints repository.

Of the 27 participants who were aware their research outputs were available in Otago EPrints, only 41 percent (11 participants) have noted increased citations, contact or other feedback. Table 9.7 shows the difference between those who have noticed increased citations or contact and those who have not.
Table 9.7 Participants’ perceptions of impact on citations

<table>
<thead>
<tr>
<th>Q4d: Have you noticed increased citations or contact from other researchers as a result of making your work available through the School of Business Repository?</th>
<th>Number of participants</th>
<th>Percentage of participants (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes – have noticed increased citations</td>
<td>11</td>
<td>41</td>
</tr>
<tr>
<td>No – have not notice any increased citations</td>
<td>16</td>
<td>59</td>
</tr>
<tr>
<td>Total</td>
<td>27</td>
<td>100</td>
</tr>
</tbody>
</table>

![Graph](image)

Figure 9.5 Participants who have noticed increased citations/contact vs. those who have not

Participants who said “yes” were then asked to estimate the number of extra citations or contact they had received as a result of publishing their research outputs in Otago EPrints. Of the 11 participants who have had increased citations or contacts, 4 of them said they did not know or were not sure, 5 estimated they had received 1–3 additional citations or contacts, one participant estimated 4–6, and one estimated more than 6 (see Table 9.8).
An author affiliated with the Department of Information Science claimed the highest rate of citation, followed by an author in the Department of Marketing. This clearly illustrates that the School of Business digital repository has served its citation benefit to some participants but not others. However, some participants may have more citations or contact than others simply because of the popularity of a particular research output. In addition, the research outputs with the greatest number of hits are more likely to have increased citations (Organ, 2006). For example, the Information Science author mentioned above explained “the reason why I have noticed a lot of the citations and contact is because the paper has been advertised, I emailed it to everyone”.

Another explanation why a number of participants have noticed increased citations could be that Otago EPrints has good rankings in search engines such as Google and Yahoo!, and the content in it has been indexed after they have been published (uploaded). For example, when a user searches for an article in a search engine, the entries for that article in the Otago EPrints digital repository are likely to have higher rankings, therefore they will have more hits when compared to the ones only on personal or departmental web sites.

For those participants who were not sure or did not know the number of the additional citations or contact, the two main reasons for this were:

1. The participants had never checked their number of citations and;  

Table 9.8 Participants’ number of additional citations/contact

<table>
<thead>
<tr>
<th>Number of citations</th>
<th>Number of participants</th>
<th>Percentage of participants (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3 citations/contact</td>
<td>5</td>
<td>45</td>
</tr>
<tr>
<td>4-6 citations/contact</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>More than 6 citations/contact</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Not sure/Don’t know</td>
<td>4</td>
<td>37</td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
<td>100</td>
</tr>
</tbody>
</table>
2. They had copies of research outputs stored in multiple locations (including Otago EPrints), so they could not tell whether it was because of Otago EPrints or some other repository.

A number of participants provided additional comments, some of which are reproduced below:

Let me put it this way, I never consciously either try to get publications in those [online] journals that would make them available, nor have I tracked it to see where it is. This may sound terrible, once I finished publishing it, I move on to something else... [laugh].

My contact has increased a bit over the years but who knows why that is... it could be multiple explanations. I cannot say that I suddenly started to get more queries about my research because I have my papers on SSRN or Otago EPrints repository. I don’t know...

The people who have contacted me don’t usually say where they saw it. Most of my working papers eventually come out as journals anyway, so I am not sure, they might have seen a published version or other versions and also there are multiple locations where they can get my research output from.

What happened when I first put it on was I got emails from everyone across the world and it was incredible. I don’t know how they got it on Google but I had a lot of contact... I was astounded how many hits we got from the digital repository.

9.6 Publishing Attitude and Experience

There are several ways an author can provide open access to research outputs by self-archiving. For example, a particular author can archive a copy of a research output on a personal or departmental web site, or submit it to an institutional open access digital repository, or place it in another subject-based, centralised, open access online digital repository, such as ArXiv (physics) or Cogprints (cognitive science). In addition, the form of research output can be either preprint (before peer review or refereeing) or postprint (after peer review or refereeing).

In this section, participants were first asked whether they had ever previously made any research outputs available in any open access online digital repository or web site (personal or departmental), and if so, which ones.
Surprisingly, 40 percent of participants had *never* made any research outputs available in any open access repository or website, compared to 60 percent who had. The results are shown in Table 9.9.

**Table 9.9 Location (open access) that participants deposited their research outputs**

<table>
<thead>
<tr>
<th>Online Digital Repositories</th>
<th>Number of participants</th>
<th>Percentage of total participants (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Web site</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>Departmental Web Site</td>
<td>17</td>
<td>43</td>
</tr>
<tr>
<td>Social Science Research Network</td>
<td>7</td>
<td>17</td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>Never</td>
<td>16</td>
<td>40</td>
</tr>
</tbody>
</table>

**Figure 9.6 Locations where participants deposit their research outputs**
According to Figure 9.6, the majority of participants have made their research outputs available through departmental web sites, a quarter through personal web sites, 17 percent through the Social Science Research Network (SSRN), and 15 percent for other open access repositories such as RePEc\(^{29}\) and European Central Bank\(^{30}\).

However, it is surprising to see that all six participants in the Department of Marketing have never published their work in an open access repository. Moreover, the Department of Economics has the highest submission rate to the Social Science Research Network (SSRN). This reveals that the SSRN is the “standard” repository for authors in the Department of Economics to make their research outputs available through.

In the same way, participants within the Department of Information Science claimed the highest rate of making their research outputs publicly available through personal web sites. Moreover, three departments within the School of Business are currently using their departmental web sites as a portal for dissemination of departmental research outputs. By making research outputs publicly available on departmental

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\(^{29}\) Research Paper in Economics (http://repec.org/)

\(^{30}\) European Central Bank (ECB) (http://www.ecb.int/)
web sites, this reveals that a number of departments within the School of Business support open access to some degree:

On our departmental website, there is a link to my personal page which is managed by the departmental administrator and has some details of my research outputs – each of them has a link to the journal web site.

### 9.6.1 Reasons for publishing in open access digital repositories or web sites

It seemed important to gain an understanding of what motivated participants to publish and share their research outputs with others. In the next question, participants were asked: *If you HAVE made any of your research outputs available in any open access repository or website, what are your reasons for doing so? (Q5a).* The reasons for publishing in open access digital repositories or web sites included:

- A wish to support the open access publishing philosophy:
  
  I want to make it easy for readers, I am paid by the community therefore anything I produce should be their property or they should have equal access to it.

- They needed somewhere to put the research output.

- Several participants were invited to submit their research outputs to an open access repository or web site by a colleague:
  
  My colleague is my co-author for a couple of articles and he was quite keen to put the articles in [a repository] and he told me about it.

### 9.6.2 A digital repository for PFRF-eligible research outputs

Otago EPrints was launched just before the second PBRF round in 2006. As such a number of authors used research outputs made available in the School of Business digital repository as a part of their PBRF evidence portfolio.

The University of Otago is planning to create a University-wide digital repository for PBRF-eligible research outputs which will run in parallel with the Otago EPrints repository. Participants were therefore asked whether they would be interested in using such a repository when it becomes available.
Table 9.10 Participants’ views about the proposed PBRF-eligible digital repository

<table>
<thead>
<tr>
<th></th>
<th>Number of participants</th>
<th>Percentage of total participants (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>32</td>
<td>80</td>
</tr>
<tr>
<td>No</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Not sure</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100</td>
</tr>
</tbody>
</table>

Q7: The University of Otago is planning to create a digital repository for PBRF-eligible (i.e., quality controlled) research outputs. Would you be interested in using such a repository when it becomes available?

According to Figure 9.8, most of the participants (80 percent) were interested in and excited about using this new repository. However, there were a few (10 participants) who were not interested as they preferred to get their research outputs out of more well-known international journals. One participant argued:
I see that the University is playing games to try to increase the PBRF score by encouraging people to submit research outputs into the repository. I don’t think this will improve the quality of research outputs. I still am aiming to get it in the journal.

Interestingly, this particular participant has clearly misinterpreted the intent of the new repository. It is not intended as an alternative to the likes of journals; rather it is intended as a place to showcase high-quality Otago publications that have already been published (i.e., the authors would publish their paper in the journal as usual, then deposit a copy in the repository). Perhaps this misinterpretation could have come from the way the question is phrased, where the intended role of the new repository is not clearly mentioned.

9.7 Concerns & Conditions

Clearly, if participants had any concerns that might deter them from depositing their work, it was important to investigate these concerns so they could be addressed by the School of Business administration.

Participants were asked: What concerns do you have about making your research outputs available in digital repository? (Q9) These include refereed and non-refereed research outputs that may develop into a journal publication or similar. This question explored potential or perceived barriers to depositing research outputs in an open access repository.

Forty-five percent of participants said they had no concerns about depositing their research outputs online. Most concerns mentioned by participants were associated with the risks that arise from sharing research outputs in public, including intellectual property rights and copyright. Gadd, Oppenheim and Probets (2003) said that 32 percent of the authors they surveyed were unaware of the copyright status of their journal articles. Moreover, Bates, Lodddington, Manuel and Oppenhiem (2007) found that “some educators may be wary of sharing their resources within and beyond their own communities of practice if there is a risk of IPR [Intellectual Property Rights] being violated”. Similar concerns are echoed by some of the participants in the current study:

Academic ideas are very important – For example, if I put my ideas in a working paper and make it publicly available, people might use my idea in
their paper and get published before me. I would not want to put my work [publicly] available before it gets published in a journal...

This is a common problem with SSRN and everything. You either don’t put anything out there or you do it – it is more of a personal choice really. For some people, because of the nature of their research I understand that they would not put some of their stuff out there...

The culture norm in Economics is that once you have a paper published in a journal, you can then no longer have the working paper sitting on your web site – that will contravene the copyright...

Harnad (2006) explained that all work made publicly available can be plagiarised in many ways but also claimed that plagiarism of online open access work is easier to detect. The only way to make plagiarism impossible is to not publish, deposit or make the work accessible to anyone. A number of participants supported this argument regarding intellectual property issues:

I found that extraordinarily naive because if I write something and it is published somewhere then some other people can use it. For example, if they don’t cite me and go ahead and take my work and publish without any reference to me – I have no control over that. Ultimately, that paper will not get accepted as the reviewer in that area would know that it is similar... I think people are fooling themselves [laugh].

The way to work around this is you could put your work in a conference and present your idea – in that way with the core idea in the conference paper, you can publish online a larger version. At least your work will have some kind of protection and then it can be placed in the open access repository...

Putting your work in the Otago EPrints, the research output gets the date stamp. That is one way to protect your idea.

In addition, many participants were already involved in depositing their research outputs for inclusion on their personal web site, departmental web site or some other open access digital repository, for inclusion in PBRF submissions, departmental promotion and funding. Therefore there were concerns that requesting their research outputs to be included in the School of Business EPrints repository might result in duplication of effort.

However, a few participants noted that they might need assistance in depositing their work:
I would like to get my work on there but I don’t know how to or who is the right person to send my work to. I have got a list of work that people have asked and I want to get it on there... It would be nice if I can send those articles to someone and they can deposit them for me...

I'm more than happy to put my working papers in the repository as long as it does not require much work...

These comments strongly suggest that the current training to all departmental administrators within the School of Business is of its value to these individuals.

9.8 Material Types

The types of material that can be archived, for example departmental working papers, theses, dissertation, lecture materials, audio and image files, are a factor in whether an author might deposit a research output, as the value of a repository depends on the number of authors contributing (Rankin, 2005). Participants were asked: The School of Business repository currently contains a wide range of material, both refereed and non-refereed, from both academic staff and postgraduate students. What kinds of material do you feel might be appropriate to store in an institutional digital repository?

A majority (63 percent) supported refereed (postprint) versions of research outputs whereas 50 percent of the participants supported non-refereed material. Both working paper/discussion paper and theses/dissertation were supported by 38 percent, 25 percent for conference papers, 23 percent for both multimedia and book chapters, 20 percent for lecture materials of all sorts, and 8 percent for data sets (see Table 9.11).

A few participants felt that the refereeing process enhances the quality of the research outputs in areas such as grammar and accuracy of the content. Consequently, by depositing refereed outputs, the quality of Otago EPrints repository would also be improved.

Electronic storage of all publications like refereed and non-refereed, preprint and postprint would be great. Theses, dissertations and reports would be more easily accessible. However, they must meet a certain standard.

Our repository should be a good clean source of information. Moreover it should not just be a dumping ground for putting all the work.
I think it’s good to have the theses and dissertations because some may turn into publications but a lot of them don’t – so it’s good to have that.

Table 9.11 Participants’ preference for material types

<table>
<thead>
<tr>
<th>Material types</th>
<th>Number of participants</th>
<th>Percentage of total participants (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refereed (Postprint)</td>
<td>25</td>
<td>63</td>
</tr>
<tr>
<td>Non-refereed (Preprint)</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Working/discussion papers</td>
<td>15</td>
<td>38</td>
</tr>
<tr>
<td>Conference papers</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>Theses/Dissertations</td>
<td>15</td>
<td>38</td>
</tr>
<tr>
<td>Lecture Materials</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>Multimedia</td>
<td>9</td>
<td>23</td>
</tr>
<tr>
<td>Book Chapters</td>
<td>9</td>
<td>23</td>
</tr>
<tr>
<td>Data sets</td>
<td>3</td>
<td>8</td>
</tr>
</tbody>
</table>

9.9 Format of Research Outputs

The next question in the questionnaire investigated the participants’ preferences for research output formats.

There were a number of studies that reported on the advantages and disadvantages of electronic and print formats. For instance, Bar-Ilan, Peritz and Wolman (2003) carried out a “large-scale” survey of academic staff in eight Israeli universities regarding their use of electronic journals and databases. They found that electronic journals and databases have had a wider acceptance than print versions, whereas the print version was preferred for catching up with developments and in teaching. However, the researchers in the study indicated that “electronic materials are supplementing print, not supplanting it” (Rowlands, 2007).
Similarly, only 5 percent of participants in the current study stated they would prefer having their research output in a print version, while 52 percent preferred an electronic version, and 43 percent of the participants stated they wanted both formats (see Table 9.12).

### Table 9.12 Participants’ preference of format for their research outputs

<table>
<thead>
<tr>
<th>Q10: What format do you prefer for the research outputs?</th>
<th>Number of participants</th>
<th>Percentage of total participants (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic Version</td>
<td>21</td>
<td>52</td>
</tr>
<tr>
<td>Print Version</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Both</td>
<td>17</td>
<td>43</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100</td>
</tr>
</tbody>
</table>

A number of participants provided additional comments, some of which are reproduced below:

If I make a research output available in both versions this will give people a choice. This is someone else’s benefit – I have already got my benefits by publishing, thinking about ideas and connecting to people so my
responsibility now is to enable somebody else to work from it or to get something from it. Therefore, if my outputs are in both forms then that makes it easier for people.

Most researchers these days, when they want to get hold of a paper usually request the electronic version rather than a print version. So when I am getting hold of some other researcher’s paper I always use the electronic version.

I think an electronic version is a lot easier to distribute to people that you want to be distributed to – I can just email it.

9.10 Summary

This chapter has discussed the results of this study and used some comments made by the participants to support the various discussions. These comments provide a brief summary of some of the more common opinions expressed by the participants. A combined list of participant comments may be found in Appendix G.

The next chapter will conclude this study; giving recommendations and suggesting possible future research for the School of Business.
Chapter 10

Conclusion & Further Research

This chapter concludes this study and outlines the recommendations, limitations and suggestions of possible areas for future research.

10.1 Summary of Findings

Otago EPrints is considered to be underpopulated and underused by various departments when compared to institutional repositories at other (Business School) institutions. There is still a considerable proportion of academic staff within the School of Business, who have material in the School of Business EPrints repository, who are currently unaware of the possibility of making their work publicly available by depositing their research outputs in the School of Business digital repository (note that this study has not considered the level of awareness amongst staff who don’t have material in the Otago EPrints repository). In addition, most authors in various departments have no motivation to use and little knowledge of Otago EPrints to disseminate their research outputs. Some of them hold perceptions regarding awareness, functions and benefits associated with using the Otago EPrints digital repository. A number of authors in the study have concerns mainly with regard to intellectual property rights and copyright issues.

The results clearly suggest that authors from various departments within the School of Business have already engaged with the open access movement, as illustrated by a number of authors making their research outputs publicly available in personal and departmental web sites, and in some other open access digital repositories such as SSRN (Social Science Research Network) and RePEc (Research Papers in Economics). The majority of the authors in this study appear to support the open
access philosophy. Moreover, as a result of informing participants that Otago EPrints still exists, and of its benefits, over half the study participants are willing to deposit their research outputs in the repository as a channel for disseminating their work. However, a number of participants are unsure how to deposit and who to contact.

10.2 Recommendations

The following recommendations, if carried out, will raise awareness of the School of Business repository. They will also give authors within the School of Business a better understanding of the purpose of the Otago EPrints repository and help them achieve the full benefits of open access.

10.2.1 Champion person

The school of Business should have a person (or group of people) who has authority and responsibility with regards to the School of Business EPrints repository. The roles should include organising the training of all depositors, such as departmental administrators. They should also work towards raising academics’ awareness by carrying out workshops or seminars on the benefits of making research outputs open access and create an overview of Otago EPrints.

10.2.2 Marketing & Advocacy

A major factor in ensuring the success of the School of Business repository is the number of research outputs that are made available and the usage of the content in it. In addition, advocacy is needed within the School of Business. This means the repository needs to be marketed to the School’s academic community.

Advocacy is a method to ensure authors will continue to contribute, use and update their research outputs. It will increase awareness of the repository among academic staff and encourage authors to deposit a copy of their research outputs in the repository. For example, common approaches to raise awareness are to communicate through the university newsletter (i.e., the Otago Bulletin), to present at major meetings or seminars (e.g., weekly departmental seminars), and to use a leading researcher as a champion person (Cullen and Chawner, 2008). (See Appendix I for a detailed list of possible approaches).

Academics have to hear about your institutional repository service many times, over a period of time, and from several sources (print, online, in
person). A good rule of thumb is that someone needs to have been exposed to your service seven times before they are fully aware of your service. Be sure to outline explicitly the benefits of your service to academics (Barton and Waters, 2004).

To make the repository part of the everyday working practice of the academic is not a straightforward task. The development team (or champion person) need a commitment to promote, advertise and improve the repository to a higher level, as well as to solicit feedback from the users. Whichever methods are used, the message has to be communicated across the academic staff and it may take some time for it to penetrate.

10.2.3 Training

The results showed there were a number of authors who were unsure of how to deposit an article in the Otago EPrints repository, or who to contact in order to upload their research outputs. Hence, the School of Business should carry out training for each of the user groups involved (i.e., academic staff, departmental administrators, and library staff). They need to be exposed to the services which include its features and how is it used. For example, depositors such as departmental administrators need to be aware of the general procedure and understand the main purpose of the repository. Data entry should be carried out by specifically trained people (Stanger and McGregor, 2007). Therefore, it is essential to have training in the processes and standards for data entry such as a metadata creation procedure.

10.2.4 Policy

A policy that mandates authors to deposit their research outputs can have significant advantages. Providing a mandate has shown to be helpful in the awareness and use of repositories at other universities around the world. The School of Business should consider drafting a policy that requires an electronic version of theses and dissertations for all postgraduate students to be submitted for inclusion in the Otago EPrints repository. A similar policy could also be considered for other research outputs. In that way, more items will be put into the repository, thus raising the awareness of academic staff within the School of Business. In general, the institutional repositories are likely to play in an important future role in improving academic communities. Therefore, the best approach to “make this happen” is to “make [depositing] mandatory” (Pinfield, 2005).
Furthermore, Darnton (2008) states that “by mandating copyright retention and by placing those rights in the hands of the institution running the repository, [this] will create the conditions for a high deposit rate”.

For example, Queensland University of Technology (QUT) has the most items in its repository (QUT EPrints\(^3\)), compared to other Australian institutional repositories, because QUT have a mandatory policy in place for its departments to “self-deposit” their research outputs in QUT EPrints. In addition, it also has a high rate of full-text availability on the databases (Xia and Sun, 2007).

### 10.3 Limitations

This study has successfully achieved its aim. However, there are a number of limitations to this study that provide opportunities for further research.

Firstly, a limited time-frame was a major factor in this study. The interview process was carried out over a two-week period. However, a longer time frame could allow a larger number of participants, thus producing more meaningful results.

A large proportion of the authors of items in the repository are not currently located at the University of Otago; many of them are postgraduate students who have moved on to another institutions, cities or countries. This significantly limited the pool of possible participants.

In addition, participation in the study was limited only to authors of research outputs in the repository. It would be interesting to broaden the study to include academics within the School of Business who do not have research outputs in the repository.

Fourth, a factor that may be a bias in this study is the participants themselves. Participants filled in the questionnaires before the interviews with the interviewer present in the room. This may have affected the way they answered the questions. Although this is probably not a large factor it may have introduced some bias into the study.

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\(^3\) QUT EPrints (http://eprints.qut.edu.au/)
Finally, this study only intends to evaluate the impact on authors at the University of Otago School of Business. Therefore, the findings of this report are not generalisable to institutional repositories at other universities.

10.4 Future Research

Future research will need to consider ways of engaging authors in a prudent approach. It could be conducted with a similar manner but from the different points of view outlined below (these are just a few suggestions):

- The number of publications categorised by junior vs. senior staff
- A similar study but with more participants and a wider range of authors
- User behaviour when searching for an open access article
- Author’s opinion regarding bibliometric tools, such as citation indexes for the purpose of measuring citations.
References


van Eijndhoven, K., and van der Graaf, M. (2007). Inventory study into the present type and level of OAI compliant Digital Repository activities in the EU. *White Paper, Version 0.9*.


Appendices
Appendix A: Bethesda Statement on Open Access Publishing

An Open Access Publication in one that meets the following conditions:

1. The author(s) and copyright holder(s) grant(s) to all users a free, irrevocable, worldwide, perpetual right of access to, and a license to copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship, as well as the right to make small numbers of printed copies for their personal use.

2. A complete version of the work and all supplemental materials, including a copy of the permission as stated above, in a suitable standard electronic format is deposited immediately upon initial publication in at least one online repository that is supported by an academic institution, scholarly society, government agency, or other well-established organization that seeks to enable open access, unrestricted distribution, interoperability, and long-term archiving (for the biomedical sciences, PubMed Central is such a repository).

Notes:

i. Open access is a property of individual works, not necessarily journals or publishers.

ii. Community standards, rather than copyright law, will continue to provide the mechanism for enforcement of proper attribution and responsible use of the published work, as they do now.

(Suber, 2003)
Appendix B: Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities

Open access contributions must satisfy two conditions:

1. The author(s) and right holder(s) of such contributions grant(s) to all users a free, irrevocable, worldwide, right of access to, and a license to copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship (community standards, will continue to provide the mechanism for enforcement of proper attribution and responsible use of the published work, as they do now), as well as the right to make small numbers of printed copies for their personal use.

2. A complete version of the work and all supplemental materials, including a copy of the permission as stated above, in an appropriate standard electronic format is deposited (and thus published) in at least one online repository using suitable technical standards (such as the Open Archive definitions) that is supported and maintained by an academic institution, scholarly society, government agency, or other well-established organization that seeks to enable open access, unrestricted distribution, inter operability, and long-term archiving.

(Max Planck Society for the Advancement of Science, 2003)
Appendix C: New Zealand Repositories

1. Institutional Repositories Aotearoa (Ira)

The aim of Institutional Repositories Aotearoa (Ira) is to make available research outputs created by staff and students from the three partner institutions through open access institutional repositories.

Participants: University of Auckland, University of Canterbury and Victoria University.

Software Platform: DSpace

2. CODA: An Institutional Repository for the New Zealand ITP Sector

CODA: An Institutional Repository for the New Zealand ITP Sector is a digital commons project that highlights institutes of technology and polytechnic sector scholarship of various types, such as working papers, journal articles, dissertations and theses.

Participants: Canterbury Polytechnic Institute of Technology, Manukau Institute of Technology, NorthTec, UCOL: University College of Learning, Unitec New Zealand and Whitireia Community Polytechnic.

Software Platform: Bepress

3. Open Access Repositories in New Zealand (OARiNZ)

The Open Access Repositories in New Zealand (OARiNZ) Project (led by Christchurch Polytechnic Institute of Technology (CPIT)) will design and build the infrastructure necessary to connect all of New Zealand’s digital research repositories that meet standards for interoperability and access.

The project targets the three key recommendations from the National Library of New Zealand’s Institutional Repositories for the Research Sector Report. The project aims to develop capability and confidence by providing tertiary education institutes with a range of repository implementation options from which to select. Principles underpinning the project include openness of systems/standards, flexibility, sustainability and inclusiveness.
**Participants**: Christchurch Polytechnic Institute of Technology (CPIT), University of Otago, National Library of New Zealand, Nelson Marlborough Institute of Technology, Tairawhiti Polytechnic, Lincoln University, Bay of Plenty Polytechnic, Northland Polytechnic, Waikato Institute of Technology, Waiariki Institute of Technology and Wellington Institute of Technology

4. **Library Consortium of NZ (LCoNZ)**

The Library Consortium of NZ (LCoNZ) aims to use and develop the best enabling technologies in a collaboration which will enhance the innovative delivery of library and information resources and services to the NZ tertiary learning and research community.

**Participants**: AUT University, University of Waikato, Victoria University of Wellington and University of Otago

**Software Platform**: DSpace

5. **Australasian Digital Theses Program (ADT)**

The aim of the Australasian Digital Theses Program (ADT) program is to establish a database of digital copies of theses produced by postgraduate students at various Australian and New Zealand universities.

**New Zealand Participants**: AUT University, Lincoln University, Massey University, University of Auckland, University of Waikato, University of Canterbury and University of Otago

(OARiNZ, 2009)
Appendix D: Initial Email Invitation

Dear,

My name is Ake Sanmaneechai. I am currently studying toward a Master of Business in Information Science at the University of Otago. My research topic is 'Evaluating the impact of the School of Business Digital Repository'.

This is an applied research study that intends to assess the impact of the School of Business Digital Repository (Otago EPrints) on the authors of material stored in the repository. This will be partly achieved by means of a series of personal interviews. The participants in this study are the authors of research outputs that are stored in the School of Business Repository (both staff and postgraduate students) who are currently available on campus (please also see the attached information sheet).

I would therefore like to set up a face-to-face (personal) interview with you. The interview will take approximately 15-30 minutes. All data gathered will be securely stored; any personally identifying information will be used for data management purposes only and will be destroyed at the completion of the project.

I have already discussed this matter with and obtained approval from Claire Ramsay (Director of Administration of the School of Business), and category B ethical approval for the personal interviews has been granted by Prof. Martin Purvis (Head of Information Science Department).

The results of the project will be published as a Master of Business (MBus) final report, which will be made available through the School of Business Digital Repository.

If you are willing to take part in this study, please kindly let me know when would be a suitable time for the interview by simply reply this email with date and time. I have also attached a consent form for you to fill in.

Thank you very much for your time. I will be contacting you by phone to confirm the date and time of the interview.

If you have any questions about the project, either now or in the future, please feel free to contact either myself or my supervisor (Dr Nigel Stanger):-

Charupol (Ake) Sanmaneechai or Dr. Nigel Stanger
Department of Information Science Department of Information Science
Telephone Number:- 021 108 0539 University Telephone Number:- x8179
Email:- csanmaneechai@business.otago.ac.nz Email:- nstanger@infoscience.otago.ac.nz

Kind Regards,

Charupol (Ake) Sanmaneechai

Disclosure: Participant information and consent sheets

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EVALUATING THE IMPACT OF THE SCHOOL OF BUSINESS DIGITAL REPOSITORY — INFORMATION SHEET FOR PARTICIPANTS

Thank you for showing an interest in this project. Please read this information sheet carefully before deciding whether or not to participate. If you decide to participate we thank you. If you decide not to take part there will be no disadvantage to you of any kind and we thank you for considering our request.

What is the Aim of the Project?

The aim of the project is to assess any impact that the School of Business Digital Repository may have had on authors within the School. It is an applied research study being undertaken as part of the requirements for the Master of Business. The study will help to answer questions such as:

- How much do authors within the School know about the Repository and its contents?
- Has the Repository affected the availability and dissemination of authors’ research outputs?
- Has placing material in the Repository had an impact on citations and contacts from other researchers?
- What are authors’ perceived issues with placing research outputs in the Repository?
- What other online repositories (or similar) are authors using and why?
- How willing are authors to place research outputs in the School of Business Repository compared to other online repositories?

What Type of Participants are being sought?

The participants in this study are authors of research outputs that are currently stored in the School of Business Repository, who are currently on campus at Otago.

What will Participants be Asked to Do?

Should you agree to take part in this project, you will be asked to take part in a short, structured interview about your experiences with the School of Business Repository.
Digital Repository. This interview should take at most half an hour and will usually take less time than this.

Please be aware that you may decide not to take part in the project without any disadvantage to yourself of any kind.

**Can Participants Change their Mind and Withdraw from the Project?**

You may withdraw from participation in the project at any time and without any disadvantage to yourself of any kind.

**What Data or Information will be Collected and What Use will be Made of it?**

The interviewer will transcribe your answers to the interview questions, and may, with your permission, record the interview for later review. The interviewer will also note your name, department and general information such as whether you are staff (senior or junior) or a student.

The answers to the interview questions will be used to assess the overall impact of the Repository on authors within the School. Participant names will be used only for data management purposes, and will be stored separately from interview transcripts. The other data collected will be used to build a statistical profile of authors within the School.

The raw data will be available only to the interviewer and his supervisor. These data will be collated and analysed to build a profile of the impact that the Repository has had on authors within the School. Identifying information such as names will be destroyed once analysis is complete. The final report may contain the text of answers to questions, but these will not be traceable to the original participant. A copy of the completed study will be provided to the Office of the Dean.

The results of the project will be published as an MBus final report, which will be made available through the School of Business Digital Repository, but every attempt will be made to preserve your anonymity. The final report will also be viewed by two markers, and a copy will be provided to the Office of the Dean to assist in future planning for the Repository.

You are most welcome to request a copy of the results of the project should you wish.

The data collected will be securely stored in such a way that only those mentioned below will be able to gain access to it. At the end of the project any personal information will be destroyed immediately except that, as required by the University's research policy, any raw data on which the results of the project depend will be retained in secure storage for five years, after which it will be destroyed.
Reasonable precautions will be taken to protect and destroy data gathered by email. However, the security of electronically transmitted information cannot be guaranteed. Caution is advised in the electronic transmission of sensitive material.

**What if Participants have any Questions?**

If you have any questions about our project, either now or in the future, please feel free to contact either:-

Charupol (Ake) Sanmaneetchai
Department of Information Science
University Telephone Number:-
Email:- sanch607@student.otago.ac.nz

or

Dr. Nigel Stanger
Department of Information Science
University Telephone Number:- x8179
Email:- nstanger@infoscience.otago.ac.nz

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*This research has been reviewed and approved by the*

*University of Otago Human Ethics Committee*
I have read the Information Sheet concerning this project and understand what it is about. All my questions have been answered to my satisfaction. I understand that I am free to request further information at any stage.

I know that:

1. my participation in the project is entirely voluntary;
2. I am free to withdraw from the project at any time without any disadvantage;
3. the data and any audio recordings of interviews will be destroyed at the conclusion of the project but any raw data on which the results of the project depend will be retained in secure storage for five years, after which it will be destroyed;
4. the results of the project will be published as an MBus final report, which will be made available through the School of Business Digital Repository, but every attempt will be made to preserve my anonymity.

I agree to take part in this project.

.................................................................................................................... ........................................
(Signature of participant)                                               (Date)

This research has been reviewed and approved by the

University of Otago Human Ethics Committee

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Appendix F: Questionnaire

Evaluating the impact of the School of Business Digital Repository

This questionnaire will have 13 questions and will take about 10 - 15 minutes to complete. Hope that you will spare a little time to participate in this questionnaire. Your responses will be kept completely confidential and all the information will be destroyed after the study has been completed. You may, of course, remain anonymous if you wish.

### About you

1. What is your name?

2. At the time you were working on your research, in which following Department in the School of Business did you work for?
   - Accountancy and Business Law
   - Economics
   - Finance and Quantitative Analysis
   - Information Science
   - Management
   - Marketing
   - Tourism
   - Other – Please specify: ____________________________

3. Which option best describes you?
   - Academic staff (Please indicate: senior or junior)
   - Postgraduate student
   - Research assistant
   - Other – Please specify: ____________________________

### Awareness of School of Business ePrints Repository

4. Are you aware of the School of Business ePrints Repository?
   - Yes
   - No
   - How long for? : ____________________________

   a. Are you aware of any of your research outputs (articles, technical reports, etc.) being made available in the School of Business ePrints Repository?
      - Yes
      - No

   b. If yes, do you know how many of your research outputs (either alone or with co-authors) are available in the repository?
      - None
      - 1 - 3
      - 4 - 7
      - 8 - 10
      - More than 10

   c. If yes, what types of research output are they?
      - Scholarly journal articles
      - Conference papers
      - Technical papers
      - Working papers
      - Theses/dissertations
      - Other – Please specify: ____________________________
Your reasons for publishing in School of Business ePrints Repository

d. Have you noticed increased citations or contacts from other researcher as a result of making your work available through the School of Business Repository?

☐ Yes  ☐ No

If Yes, how many ________________

e. Have you ever directly requested that one or more of your research outputs be included in the repository?

☐ Yes  ☐ No

f. If yes, what were your reasons for doing so?

________________________________________________________

________________________________________________________

g. Would you be more likely in future to submit your research outputs to the School of Business Repository as a result of your experience?

☐ Yes  ☐ No

Your experience of publishing in online digital repository

5. Have you ever made any of your research outputs available in any other online digital repository or web site?

☐ Personal web site
☐ Departmental web site
☐ Social Science Research Network
☐ Other – Please specify: ____________________________
☐ Never

a. If so, what were the reasons for doing so?

________________________________________________________

________________________________________________________

b. Have you noticed increased citations or contacts from other researchers as a result of making your work available through these other online services?

☐ Yes  ☐ No

6. Given the option, would you prefer to make your research outputs available through:

☐ The School of Business ePrints repository
☐ Some other online digital repository
☐ Web site (i.e. personal or departmental)

Why?

________________________________________________________

________________________________________________________
Your opinion and concerns about digital repository

7. The University of Otago is planning to create a digital repository for PBRF-eligible (i.e., quality controlled) research outputs. Would you be interested in using such a repository when it becomes available?
   ☐ Yes  ☐ No

8. The School of Business repository currently contains a wide range of material, both refereed and non-refereed, from both academic staff and postgraduate students. What kinds of material do you feel might be appropriate to store in an institutional digital repository?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

9. What concerns would you have about making your research outputs available in a digital repository (both refereed outputs such as journal articles and non-refereed work that may later develop into a journal publication or similar)?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

10. What format do you prefer for the research outputs:
    ☐ Print version  ☐ Electronic Version  ☐ Both

Others

11. Do you know what Open Access is with regards to research outputs?
    ☐ Yes  ☐ No

12. In your own field, approximately how many Open Access journals are you aware of?
    ☐ None  ☐ 1-7  ☐ Not Sure
    ☐ 1-3  ☐ 8-10  ☐ More than 10

13. Are you aware that many of the research outputs in the School of Business Repository are open access (publicly available full text)?
    ☐ Yes  ☐ No

If you have any questions concerning this survey please feel free to contact either:-

Ake Sammaneechai
Department of Information Science
Phone: 021 108 0539
Email: san141@yahoo.com

Dr Nigel Stanger
Department of Information Science
Extension 8179
Email: NStanger@infoceice.otago.ac.nz

Thank you very much for your time.
Appendix G: Relevant Comments From Participants

This section lists a representative selection of relevant comments made by participants during the interviews, categorised by theme.

Awareness & Use of the Otago EPrints:

- “I know it through the development team. However I have not heard much from the School of Business itself regarding the repository. I think there was a little bit of talk but it does not get heavily promoted... this is from what I see, some other people in different departments may have a different view on it”

- “I am aware of it because it has been discussed in departmental meetings, and I am pretty sure our departmental discussion papers are in the repository. However I have not interacted with it for a very long time”

- “I know a member in the development team and my Master’s thesis is involved in the repository”

- “There was an email we were told about it when the development team were working on it”

- “I remember there was an email coming around announcing about the repository but I’ve never been on there to see if any of my outputs are there. I haven’t put anything in the EPrints myself – I don’t know if this is done automatically or not”

- “I am completely unaware that my papers are on [Otago EPrints]”

- “My colleague is my co-author for a couple of articles and he was quite keen to put the articles in [a repository] and he told me about it”

Reason for Publishing in Otago EPrints:

- “I want my research outputs to be indexed in the search engines therefore they are searchable”

- “I can reference the research outputs in the repository for the funding and promotion within the department”

- “Because it is used by other researchers and the public across the globe, so the visibility of the articles through EPrints would be better”
“We are paid to research more new ideas and I suppose to help people do things better. So I think the more we share the stronger and more useful our research is”

“I want to make it easy for readers, I am paid by the community therefore anything I produce should be their property or they should have equal access to it”

“I like the idea in the academic world and I think all the information should be widely shared… Once I finish something I would like to get it out to public as soon as possible”

“This will improve the visibility of my articles. Access to current and relevant literature will be readily available to other researchers locally and internationally. This should lead to higher quality research and publications…”

“I have requested to have my research output uploaded in 2005 – the reason for it was to beat the PBRF deadline. That’s the main purpose I saw in the system…”

“I am a great believer in dissemination of information in academic world so this is allowing more dissemination – total in favour. For example, if I am a researcher in Kathmandu or somewhere in Zimbabwe and I cannot afford to subscribe to a learning journal but I can have access via Otago EPrints repository. As a researcher, I am getting my information and my knowledge to those people in the world who are locked out of a high level of subscription based publications. I don’t gain anything but the other people gain [smile]”

“To support the open access publishing philosophy”

“It’s more of a department procedure – once I submit a paper to a discussion paper series it will become publicly available in the EPrints”

“I put one of my research outputs in [Otago EPrints] so that I could put it as a part of my PBRF”

“To make my research available online as soon as possible so other researchers can know what’s being done instead of waiting for the article to be published in a conference or a journal”

“I want to get the statistical information that EPrints offered. I think that’s an important selling point for EPrints from my point of view”

“To help initially populate the repository, plus I am able to deposit my own items directly”
• “Because it is used by other researchers and the public across the globe, so the visibility of the articles through EPrints would be better…”

• “[Otago EPrints digital repository] seems to appear higher in Google search results and is also indexed by other services”

• “To date the work and used to cite another paper”

• “To let the rest of the world know what I am researching on”

• “To get information about references and downloads”

Reason for not Publishing in Otago EPrints:

• “I have not noticed any changes. After I have put something in the EPrint nothing has come back – no one has contacted me”

• “For example, our department’s website has a list of publications such as journal articles and working paper series that could be linked to the Otago EPrints repository”

• “I am not particularly into the institutional repository. Given that I know some of my research outputs are in the repository, I’m not sure what the benefits would be… By and large, most people who are working or studying in any university will have electronic access to the top economics journals anyway, so it may be an occasional person out there who wants to get hold of one of my research outputs and cannot get electronically – I’m not guessing that is a large number of people…”

• “I can understand that if you want to put your work somewhere but you can’t get it into a journal, you can put it in [Otago EPrints] as a working paper which I see the value in. Even though you get the citations from that, they not worth the same as a journal article.”

• “I don’t actually mind if my research outputs are on the repository. The only thing I can think of is that if I have to move somewhere else or to another institution – the personal web site will still be with me and most of my papers are already there. It’s more of a management purpose”

• “I’m not sure exactly how to submit a research output in the repository, and I don’t even know how those research outputs that I have in the repository got in the repository in the first place”

• “I do not think a lot of people will look up the School of Business digital repository expecting to find much economics stuff from there because it is
called business... so I suspect most people look at the repository expecting to see stuff about business and most of what we do has nothing to do with business...”

- “I’m not sure what the benefits would be...”
- “It does not really bother me one way or the other I do not have strong feeling about open access. I only want to publish my work in journals... I have 5 or 6 journals that I can publish in”

Concerns:

- “The culture norm in Economics is that once you have a paper published in a journal you can then no longer have the working paper sitting on your website – that will contravene the copyright...”
- “Not getting cited properly – I tend to make my research output available at the same time it is being reviewed just to get it out there earlier, then after the revision there is another version of the same output. People usually cite the early version which is a working paper instead of the final version. I do wish to get a final version more cited”
- “My concern would be when my research outputs are not getting indexed by the search engines – that could happen”
- “Academic ideas are very important – For example, if I put my ideas in a working paper and make it publicly available, people might use my idea in their paper and get published before me. I would not want to put my work [publicly] available before it gets published in a journal...”
- “This is a common problem with SSRN and everything. You either don’t put anything out there or you do it – it is more of a personal choice really. For some people, because of the nature of their research, I understand that they would not put some of their stuff out there...”

Material types:

- “Electronic storage of all publications like refereed and non-refereed, preprint and postprint would be great. Theses, dissertations and reports would be more easily accessible. However, they must meet a certain standard”
- “Our repository should be a good clean source of information. Moreover it should not just be a dumping ground for putting all work”
• “I think it’s good to have theses and dissertations because some may turn into publications but a lot of them don’t – so it’s good to have that”

• “I would like to see some research articles, they can be different types from basic level non-refereed, conference articles to refereed journal articles…”

Format of the research outputs:

• “If I make a research output available in both versions it will give people a choice. This is someone else’s benefit – I have already got my benefits by publishing, thinking about ideas and connecting to people so my responsibility now is to enable somebody else to work from it or to get something from it. Therefore, if my outputs are in both forms then that makes it easier for people”

• “Most researchers these days, when they want to get hold of a paper, usually request for an electronic version rather than a print version. So when I am getting hold of some other researcher’s paper I always use the electronic version”

• “I think the electronic version is a lot easier to distribute to people that you want it to be distributed to – I can just email it”

• “Electronic. Just to save costs…”

• “I prefer both because for me – if I look at just abstracts then I would prefer an electronic version but if I am reading it more carefully then I prefer printed version”

Others:

• “I would like to get my work on there but I don’t know how to or who is the right person to send my work to. I have got a list of work that people have asked for and I want to get it on there… It would be nice if I can send those articles to someone and they can deposit them for me…”

• “I’m more than happy to put my working papers in the repository as long as it does not require much work…”
Appendix H: Usage Statistics Page (generated by EPrints)

Below is the usage statistical page showing abstract views and full-text download for past 4 weeks, downloads by countries for past 4 weeks, downloads by search engines and history of views for the item.

Otago Eprints Repository: Usage Statistics

For this sprint: Past four weeks | This year | Last year | All years
Abstract views and full text downloads for past 4 weeks

The numbers in (parentheses) are the number of distinct countries that abstract views and full text downloads originated from.

<table>
<thead>
<tr>
<th>Abstracts</th>
<th>Full text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Views</td>
<td>45 []</td>
</tr>
</tbody>
</table>

Downloads by country (derived from IP address of query) for past 4 weeks

Click on a country name or flag to view details of the eprints that have been downloaded from that country.

<table>
<thead>
<tr>
<th>Country</th>
<th>Abstracts</th>
<th>Full text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greece</td>
<td>1</td>
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</tr>
<tr>
<td>New Zealand</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Singapore</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Otago Intranet</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

Grand Totals: 9 abstract views originating from 3 distinct countries

Downloads by automated indexers and crawlers for past 4 weeks

Click on a search engine name or logo to view details of the eprints that have been indexed by that engine.

<table>
<thead>
<tr>
<th>Search Engine</th>
<th>Abstracts</th>
<th>Full text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yahoo!</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>Other search engine</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>Windows Live Search</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>Google</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Ask.com</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Grand Totals: 36 abstracts indexed
History of views for this eprint

Click on a month to see document downloads for that month. The numbers in (parentheses) are the number of distinct countries or search engines that abstract views and full text downloads originated from.

<table>
<thead>
<tr>
<th>Period</th>
<th>Abstracts</th>
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</thead>
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<td>13 (8)</td>
</tr>
<tr>
<td>2009 Apr</td>
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<td>16 (6)</td>
</tr>
<tr>
<td>2009 Mar</td>
<td>43 (7)</td>
<td>14 (5)</td>
</tr>
<tr>
<td>2009 Feb</td>
<td>41 (9)</td>
<td>11 (5)</td>
</tr>
<tr>
<td>2009 Jan</td>
<td>43 (5)</td>
<td>15 (4)</td>
</tr>
<tr>
<td>2008 Dec</td>
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<td>17 (5)</td>
</tr>
<tr>
<td>2008 Nov</td>
<td>49 (9)</td>
<td>14 (3)</td>
</tr>
<tr>
<td>2008 Oct</td>
<td>45 (7)</td>
<td>15 (5)</td>
</tr>
<tr>
<td>2008 Sep</td>
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<td>47 (8)</td>
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</tr>
<tr>
<td>2008 Jul</td>
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</tr>
<tr>
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</tr>
<tr>
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<tr>
<td>2008 Apr</td>
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</tr>
<tr>
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<td>13 (9)</td>
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<td>2007 Apr</td>
<td>27 (10)</td>
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<tr>
<td>2007 Mar</td>
<td>14 (7)</td>
<td>10 (6)</td>
</tr>
</tbody>
</table>

The original code for generating these statistics was written at the University of Melbourne, then modified and substantially rewritten by Christian McGee and Arthur Sale at the University of Tasmania (contact eprints@even.comp.utas.edu.au). Multiple archive support and several other enhancements and bug fixes were provided by Nigel Stanger at the University of Otago.
Appendix I: Approaches for Raising Awareness at the University

• Present your service in face-to-face meetings on campus – with communities, departments, individuals, by phone, in person, to staff, academics, IT departments, etc.

• Write a press release announcing the launch and distribute to all campus news outlets including faculty newsletters.

• Coordinate publicity at the department, library, and university level. Share marketing copy, posters, brochures with news office, websites, etc.

• Use printed brochures, posters, presentations and the university website to publicize the service.

• Plan events across campus and within content communities to publicize the launch of your service.

• Schedule a kick-off session for library staff to learn about your institutional repository service, ask questions, and build awareness.

• Build awareness of the institutional repository programme before you launch the service by running a pilot programme or early adopter programme.

• Do publicity both inside and outside the university. Some academics notice articles in the local newspaper and ask for more information.

• Listen to academics and end-users on campus, and remain flexible in your outlook as you gather requirements.

• Build interest in long-term preservation on campus.

• Offer presentations on topics of interest to academics and related to institutional repositories such as copyright, intellectual property rights in the digital age, etc.

(Barton and Waters, 2004)