Australian Digital Libraries: An Overview

Bhojaraju Gunjal, Shalini Urs, Hao Shi

Abstract—**The aim of this paper is to examine current trends in the development of digital libraries (DL), with particular reference to Australia. This paper is the result of primitive study based on the visits made to university libraries in Canberra, Sydney and Melbourne. The objective of this paper is to analyze the various aspects of Knowledge Organisation System (KOS) in Digital Libraries (DL) and its services. This study analyses the different projects towards the development of DL and its features in Australian universities.**

This article showcases the latest trends in DL which has adopted technologies (i.e. open source or commercial or mixed) which gives insight to re-use of the knowledge. This enables to save the time of the users & library staff within the local infrastructure. The government plays a prominent role in development of DL and Universities themselves unite together to bring out the practical ways of handling resource sharing and cut down the budget constraint. This case study will provide hints for decision making to adopt some of these features in future planning of DL.

Index Terms—**Australia, Digital Libraries, Knowledge Organisation System, Search Interface**

I. INTRODUCTION

The aim of this paper is to examine current trends in the development of digital libraries (DL), with particular reference to Australia (within the scope of libraries visited in person listed below). DL solutions are likely to be at the heart of the successful development of access and retrieval systems in the information ocean.

This article surveys progress with digitization in the libraries of Australia in planning and implementing major digitization projects [1]. Australian digital libraries (at the Federal, State, and University levels) together join hands with commercial and research organisations to take part in various DL projects. In turn their focus is on development of digital library in aspects such as integrating the wider scope of all Australian digital collections, its integration and long term prevention of these digital documents, etc.

Bhojaraju Gunjal is with the Department of Library and Information Science, University of Mysore, Mysore, Karnataka, India. Presently he is a visiting research fellow at SCSM, Victoria University, Melbourne, Australia (Ph: 61 3 9919 4574; Fax: 61 3 9919 4050; e-mail: Bhojaraju.Gunjal@gmail.com).

Shalini Urs is with the Department of Library and Information Science, University of Mysore, Mysore, Karnataka, India. (e-mail: Shalini@isim.ac.in).

Hao Shi is with School of Computer Science & Mathematics, Victoria University, Melbourne, Australia (e-mail: Hao.Shi@vu.edu.au).

This paper provides an overview of some of the current digital projects in Australia within the scope of visits made.

Currently the kinds of Knowledge Organisation System (KOS) being deployed varies in DLs. Hence there is a need to understand in depth about the knowledge organisation (KO) tools, such as library classifications, thesauri and subject heading systems and the Knowledge representation (Ontologies) that are being deployed in Digital Libraries [2].

II. SCOPE OF THE STUDY

The scope of this paper is limited to Canberra, Sydney and Melbourne libraries only. Universities are randomly selected, visited and analysed. These case studies do not depict the same aspects for other parts of Australian libraries. List of libraries visited are mentioned at the acknowledgement section.

III. DIGITAL LIBRARY SERVICES

Other than normal library routines and services, some initiatives are observed in Australian libraries are listed below. Even though all libraries follow similar kind of services to their patrons, use similar kind of equipments, only few cases are shown at Appendix A.2. For the convenience sake, few examples have explained below just to show case the services and features of DL in Australia.

A. Case Study of DL Services

A.1 Resource Sharing

A.1.1 BONUS+ **-** is a resource-sharing project that allows all staff and students of the member universities to request (hold) selected library materials from other institutions within Australia. The service is free-of-cost to the user. Current member institutions include: Deakin University, University of Ballarat, University of Melbourne, University of Newcastle, University of Technology Sydney and Victoria University. More details about this service can be referred at mentioned link from references [3].

A.1.2 CAVAL Reciprocal Borrowing Scheme - CAVAL is a reciprocal borrowing program that allows staff and students of participating libraries to borrow material from other participating libraries. More details about this service can be referred at mentioned link from references [4].

A.2 Library Services

- A.2.1 Self Checkout/Borrowing - To prevent waiting in the long queue libraries have provided Self Checkout/Borrowing facility to their users (Fig. A.2.1 – A.2.4).

- A.2.2 Book Returns – Users can return their materials without going to the return counters by dropping in the respective sections of book return holes (Fig. A.2.5).

- A.2.3 After Hours Return – Users can also return their materials even if the library is closed after hours/holidays (Fig. A.2.6).

- A.2.4 Print/Photocopying – Users can take print outs or photocopy of materials within the library through pay cards (Fig. A.2.7 – A.2.9).

- A.2.5 Microform Readers – Equipments for Special collections such as microform readers/printers are provided for research users (Fig. A.2.10 – A.2.12).

- A.2.6 Moveable Book Racks - Book racks can be moved as whole row along with the heaps of books through rotating the rod provided (Fig. A.2.13). This will save the space of the library.

- A.2.7 Internet Browsing Section – Users can use the internet facility with limited download with in their account provided (Fig. A.2.14).

- A.2.8 Group Study Section – Separate sections are provided with required infrastructure for group study and discussions within the library (Fig. A.2.15).

- A.2.9 International Cultural and news Center – Most of the universities provide a separate section for the international culture and news for the users (Fig. A.2.16).

- A.2.10 Login Credentials - All users are provided login credentials for accessing library and necessary portals.

- A.2.11 Turnitin Anti-Plagiarism Support – This tool helps to eliminate plagiarism. The Turnitin website allows students to take help in this step.

- A.2.12 WebCT/Blackboard - is a web-based application that allows user to access subject materials and communicate with other members of the class by using a web browser. Depending on how lecturer uses WebCT, students may also use it for submitting assignments and doing other types of assessment online.

- A.2.13 RefWorks - is a web-based bibliography and database manager that allows users to create their own personal database by importing references from text files or online databases. Users can use these references in writing papers and automatically format the paper and the bibliography in seconds.

- A.2.14 Library Services for Students with a Disability - Library works in close cooperate with Disability Services to support the library services and resources that need to be provided to students with a disability. More details about this service can be referred at mentioned link from

further readings (E.g. VU, UTS, etc). Few software and hardware available for Special Needs are:

  - o Kurzweil 3000 - is an adaptive software solution designed for people with a print disability. It specifically targets the needs of low vision users as well as users with a learning disability such as dyslexia.

  - o Voice recognition software - Some students may find it useful to input computer text or control applications by using voice commands instead of via the keyboard or mouse. Dragon Naturally Speaking Software is available

- A.2.15 Document Supply Service - Search and Request facility is provided along with login credentials. This service is available to Staff, Masters, PhD and research students only. More details about this service can be referred at mentioned link from further readings.

  - o A.2.15a Online Search & request System – is an online system which enables you to search, create and track your interlibrary loan requests. Search for Title of Journal/Book in OPAC @ CISTI, Libraries Australia, OPAC @ VU.

  - o A.2.15b CISTI Source – is a document delivery service from the Canada Institute for Scientific and Technical Information. This service is for postgraduates and staff only. More details about this service can be referred at mentioned link from references (e.g.: University of Melbourne) [5].

- A.2.16 Laptop Loans - Laptop Loans for Student Use – Library laptops will be loaned out to VU Students for academic work. They will be available for use:
  - o within the library (to supplement in-library demand)
  - o for presentations (to accompany an LCD projector)
  - o loan period is 4 hours

- A.2.17 Home Library Service - The Geelong Regional Library provide a home library service for people who are unable to access public libraries through any other means. The service is delivered free of charge by volunteers.

- A.2.18 Library Search Interface – Libraries started integrating new technologies and web 2.0 features in their library tools to enable the users to provide new look and user friendly features.
  - o The new library Catalogue Search Interface is powered by commercial software i.e. Encore, Innovative Interfaces, Inc. More details about this tool can be referred at mentioned link from references [6].
  - o Third party tools are used to integrate the book cover images, tags, etc in search results to give better User Interface (UI).
  - o In future, plan to implement advanced features such as information visualization (IV) aspects.

Fig. No.1 Old Search Interface

Fig. No.2 New Search Interface

B. Case Study: National Library of Australia (NLA), Canberra

The National Library of Australia (NLA) is the country's largest reference library. Its role is to ensure that documentary resources of national significance relating to Australia and the Australian people, as well as significant non-Australian library materials, are collected, preserved and made accessible either through the Library itself or through collaborative arrangements with other libraries and information providers [7].

Some of the digital projects from NLA are:

B.1 Libraries Australia

Libraries Australia is a resource sharing service coordinated by the NLA for Australian libraries and their users. It is used for reference, collection development, cataloguing and interlibrary lending. The Libraries Australia service replaces earlier systems, Kinetica and the Australian Bibliographic Network (ABN) - which was created in 1981 to foster resource sharing by Australian libraries [8].

The NLA is managing a federated search project which aims to enable web users to search the collections of Australian archives, galleries, libraries and museums through a single search. Libraries Australia and Picture Australia is compliance with the OpenSearch search protocol and is registered as an OpenSearch source at A9.com. Users can use an OpenSearch compliant client to search Libraries Australia or even build their own service that includes Libraries Australia as an OpenSearch target.

Fig. No.3 Search Result Interface using OpenSearch

B.2 Picture Australia

Picture Australia is an Internet based service that allows users to search many significant online pictorial collections at the same time. This provides access to images that cover all aspects of Australiana:

- Artworks include paintings, drawings, prints and posters of abstract art, fine art and portraits
- Photographs capture people, places and events
- Objects include sculpture, scrimshaw, bark, costume, weapons
- Images may be in black and white or full colour.

More details about this service can be referred at mentioned link from references [9].

B.3 Music Australia

Music Australia is an online service developed by the NLA and the National Film and Sound Archive and other cultural institutions across the nation. Users can discover, access and navigate a rich store of information on Australian music, musicians, organisations and services, all from a single access point. More details about this service can be referred at mentioned link from references [10].

B.4 PANDORA, Australia's Web Archive

The name, PANDORA, is an acronym - Preserving and Accessing Networked Documentary Resources of Australia [11]. The purpose of the PANDORA Archive is to collect and provide long-term access to selected online publications and web sites that are about Australia, are by an Australian author on a subject of social, political, cultural, religious, scientific or economic significance and relevance to Australia, or are by an Australian author of recognised authority and make a contribution to international knowledge.

B.5 Australia Dancing

The Australia Dancing portal, hosted by the NLA, provides users with access to both current and historical information about dance in Australia. Australia Dancing is an initiative of the NLA in partnership with key collecting institutions and the peak industry and advocacy body for dance in Australia – Ausdance [12].

B.6 RAAM

The Register of Australian Archives and Manuscripts (RAAM) is a guide to collections of personal papers and non-governmental organisational records held by Australian libraries and archives [13].
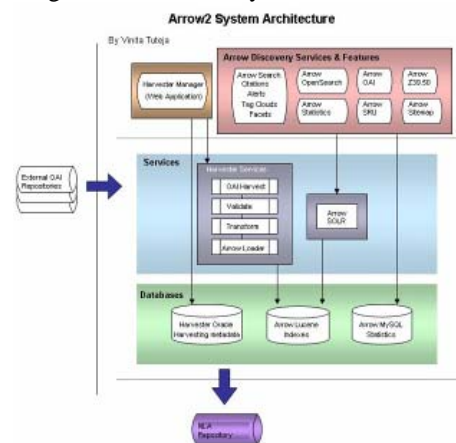
C. Related Digital Library Projects

C.1 ARROW Project

The Australian Research Repositories Online to the World (ARROW) project has been very successful in providing tools to enable accessibility and discoverability of research from institutional repositories. The NLA announced the new ARROW Discovery Service website and is operational at http://search.arrow.edu.au. [14].

ARROW Community members are: Central Queensland University, La Trobe University, Macquarie University, Monash University, Murdoch University, National Library of Australia, Queensland University of Technology, Swinburne University of Technology, University of Ballarat, University of Newcastle, University of New England, University of New South Wales, University of South Australia, University of Southern Queensland, University of the Sunshine Coast, University of Western Sydney.

Metadata harvesting in ARROW will taken care in below fashion.

Fig. No.4 ARROW System Architecture

Source: National Library of Australia

C.2 ADT Program

The aim of the Australasian Digital Theses (ADT) program is to establish a distributed database of digital versions of theses produced by the postgraduate research students at Australian universities. The theses will be available worldwide via the web. The ideal behind the program is to provide access to, and promote Australian research to the international community. The ADT concept was an initiative of 7 Australian universities (listed below) in association with the Council of Australian University Librarians (CAUL) [15].

The original ADT membership group: University of New South Wales (lead institution), University of Melbourne, University of Queensland, University of Sydney, Australian National University, Curtin University of Technology and Griffith University.

C.3 DART Project

The Dataset Acquisition Accessibility & Annotation e-Research Technologies (DART) project is an ambitious proof-of-concept project to develop tools to support the new collaborative research infrastructure of the future. The project aims to enable researchers and reviewers to access original and analysed data, collaborate around the creation of research outputs, stored publications, plus add content, annotations and notes [16].

The DART project partners are Monash University (lead institution) in Melbourne, The University of Queensland in Brisbane and James Cook University in Townsville.

C.4 ARCHER Project

The Australian Research Enabling Environment (ARCHER) project has setup dedicated development teams within each partner University to: analyse eResearch data collection; analyse information management needs and requirements, and take special note of existing IT applications and services in each research area. The ARCHER development teams have built upon the prototype software developed by the DART and ARROW projects to produce a robust set of software tools [17].

The ARCHER project partners are Monash University (lead institution) in Melbourne, The University of Queensland in Brisbane and James Cook University in Townsville.

C.5 APSR Project

The APSR Project aims to establish a centre of excellence for the management of scholarly assets in digital format. APSR is a partnership that aims to promote excellence in building & managing these collections of digital research objects. The Partnership receives Federal Government funding to assist Australian researchers with research information management. To this end, APSR conducts outreach and educational programs and undertakes collaborative development of systems and tools [18].

Current partners in this project are: The Australian National University, National Library of Australia, The University of Queensland, The University of Sydney, The Australian Partnership for Advanced Computing, The University of Melbourne and University of Technology Sydney.

IV. CONCLUSION

The libraries of Australia have been active in recent years in planning and implementing major digitization projects. Digitization projects are commonly scoped with a view to avoiding potential infringement of copyright, or avoiding the complexities that arise from uncertainties in this area. For example, libraries may seek to avoid copyright issues with future digitization projects by negotiating permissions at the time of acquisition [1].

Initial observations made from the study are:

- UI is improved by commercial software in some libraries. Third party tools are used to give better UI to the users in

the search results. (e.g.: integrating the book cover images, tags, etc in search results).

- Usability of information visualization (IV) aspects in DL is in progress and yet to implement.
- Mandatory submission of theses has yet to implement in all universities. Few universities (e.g.: UNSW) has mandated students to submit their work in digital copies along with hardcopy.
- All universities are not mandated to collect theses in digital format from their students/staff due to copyright issue. This may be one of the hurdles in developing digital libraries in e-scholarly publishing area. This may be due to various reasons viz.
  - o not to make work public (students' perspective)
  - o information may contain Cultural sensitiveness
  - o may be funded by company (due to commercial use/intellectual property reasons)

The government plays a prominent role in development of DL and Universities themselves unite together and brings out the practical ways of handling resource sharing and cut down the budget constraint.

To sum up, development of DL is rapid and lot of tools i.e. both commercial and open source are available now-a-days can integrate to enhance the search strategy and Information Retrieval (IR) process to give better UI. Hence the hybrid model with different aspects of KOS deployed in DL will enhance the IRS process and may be a suitable solution [19].

REFERENCES

[1] Warwick Cathro: Digitization in Australasia; *Serials: The Journal for the Serials Community*, Volume 20, Number 1, March 2007, Pp. 9 – 15. Available:http://uksg.metapress.com/openurl.asp?genre=article&id=doi:10.1629/20009

[2] Bhojaraju.G and Shalini R Urs: *Knowledge Organisation System in Digital Libraries: A Comparative Study*. In: Proceedings of National Seminar on Knowledge Representation and Information Retrieval, Paper: Document Research & Training Centre, ISI, Bangalore (March 22-24, 2006).

[3] Bonus+. Available: http://w2.vu.edu.au/library/lending/bonus.htm

[4] CAVAL Reciprocal Borrowing Scheme. Available: http://w2.vu.edu.au/library/lending/caval.htm

[5] CISTI Source. Available: http://dydo.infodiv.unimelb.edu.au/index.php?view=html;docid=2212

[6] Encore - Innovative Interfaces, Inc. Available: http://www.encoreforlibraries.com/main.html

[7] National Library of Australia. Available: http://www.nla.gov.au

[8] Libraries Australia. Available: http://www.nla.gov.au/librariesaustralia

[9] Picture Australia. Available: http://www.pictureaustralia.org

[10] Music Australia http://www.musicaustralia.org

[11] PANDORA: Australia's web archive Available: http://pandora.nla.gov.au

[12] Australia Dancing. Available: http://www.australiadancing.org

[13] RAAM. Available: http://www.nla.gov.au/raam

[14] ARROW Discovery Service Project. Available: http://www.arrow.edu.au

[15] Australasian Digital Theses Program. Available: http://adt.caul.edu.au/

[16] DART Project. Available: http://dart.edu.au/

[17] ARCHER Project. Available: http://archer.edu.au

[18] APSR Project. Available: http://www.apsr.edu.au

[19] Bhojaraju Gunjal and Hao Shi: *A Study of Knowledge Organisation System in Digital Libraries: An IRS Perspective;* WORLDCOMP'08: IKE'08 - The 2008 International Conference on Information and Knowledge Engineering; July 14-17, 2008, Monte Carlo Resort, Las Vegas, Nevada, USA.

FURTHER READINGS

- Geelong City Library, Geelong http://www.geelonglibraries.vic.gov.au
- Australian digitisation projects http://www.nla.gov.au/libraries/digitisation/projects.html
- VU Library Services http://w2.vu.edu.au/library/info/
- VU services for disabled http://w2.vu.edu.au/library/info/disabled.html
- UTS library services - Special needs http://www.lib.uts.edu.au/services/specialneeds
- OpenSearch.Please try our Library Labs prototype and provide some feedback on its functionality. http://librariesaustralia.nla.gov.au/opensearch/
- Federated search project http://www.nla.gov.au/initiatives/federatedsearch.html
- Kerrie Talmacs: ADT @ UNSW; 2005 http://adt.caul.edu.au/etd2005/papers/138Talmacs.ppt
- ARROW Project – Search http://search.arrow.edu.au

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• Alison Dellit • Debbie Campbell • Warwick Cathro	National Library of Australia http://www.nla.gov.au	Canberra

• Sue Kosse • Vic Elliott, Director, University Librarian	Australian National University http://anulib.anu.edu.au	
• Philip G Kent, University Librarian • Laura Maquignaz, Manager, Inform Resources • Jane Miller, Electronic Information Systems & Services Librarian	Victoria University of Technology http://library.vu.edu.au/	Melbourne
• Eve Young, Coordinator, Digital Repositories, Information Services	University of Melbourne http://www.lib.unimelb.edu.au/	
• Michael Wood, Repository Manager • Ian Smith, Manager – Library Human Resources	LaTrobe University http://www.lib.latrobe.edu.au/	
• Craig Anderson, Director	RMIT University http://www.rmit.edu.au/library	
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APPENDIX

Library Services and Equipments

Fig A.2.1 Self Checkout Counter at Victoria University

Fig A.2.2 Self Checkout at La Trobe University

Fig A.2.3 Self Checkout at University of Melbourne

Fig A.2.4 Self Checkout at UNSW, Sydney

Fig A.2.5 Book Returns at Monash University

Fig A.2.6 After Hours Returns at City Library, Geelong

Fig A.2.7 Print/Copy cards for printing at RMIT

Fig A.2.8 Photocopying pay machine at Sydney University

Fig A.2.9 Photocopying pay machine at UNSW Sydney

Fig A.2.10 Microform Reader at La Trobe University

Fig A.2.11 Microform Reader at La Trobe University

Fig A.2.12 Microform Reader at La Trobe University

Fig A.2.13 Moveable Book racks at La Trobe University

Fig A.2.14 Students internet section at Sydney University

Fig A.2.15 Group Study room at RMIT University

Fig A.2.16 International Cultural & News Center at UTS