

Matching users with information: Charles Sturt University's research focus in library and information management ¹

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with the Community of Scholars

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Abstract

Three case studies are used to illustrate the activities of Charles Sturt University's community of scholars working in the information and library studies area. The group is named *Matching Users With Information*. One study is drawn from each of the group's three areas of interest: information needs; improving information delivery systems; and ensuring the availability of information. Research being pursued by the individuals working in each area is described. Reference is also made to an embryonic fourth area, information ethics.

Introduction

The Library and Information Management group at Charles Sturt University's School of Information Studies has always been active in research, but until recently this research activity has been unfocussed. In 2003 we spent time identifying more precisely what our research was. The outcome of this audit of activities and strengths was a successful application for funding from internal sources at CSU. We now claim with pride that we are a Community of Scholars, CSU's term for an emerging research group ('emerging' means new to CSU's traditional research strengths). The name of this Community of Scholars is *Matching Users With Information*, which we think describes where our research is situated and encompasses what we will do in the future.

This paper describes the activities of this research group. It first notes the research questions the group is interested in and the activities it is undertaking to address these questions, then it illustrates in more detail some of these activities through three case studies.

The Research Leader is Professor Ross Harvey, who has research interests in preservation of information resources, and in improving user access to information through information organisation practice. Other members are Drs Gayner Eyre, John Mills, John Kennedy, Stuart Ferguson and Susan Higgins; and Philip Hider and Annemaree Lloyd, who anticipate receiving their doctoral degrees in 2004 and 2005 respectively.

Member research interests relevant to the Community of Scholars cover a wide range and include information for lifelong learning, social aspects of information seeking and use, the role of libraries in fostering literacy and reading development, public libraries and information services to special client groups,

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collection management, information-seeking behaviour, information literacy, information ethics, organisation of information, youth services in libraries, interactive information retrieval, models of information-seeking behaviour, measures of bibliographic quality, information literacy in workplace contexts, information seeking in everyday contexts, preservation, and information issues in indigenous societies.

An invitation to participate in the Community of Scholars was issued to five of the research students (doctoral and research masters) currently supervised by the members of the group. Wendy Smith, Linda Langford, Maureena Lockyer-Benzie, Terry Asla, and Tricia Kelly are all conducting research in areas related to the themes of the group. Damian Lodge, recently appointed as Lecturer in Information Management at CSU, is also participating in the Community of Scholars.

The research area

The *Matching Users With Information* research area recognises one of the central preoccupations of the library and information management (LIM) community from the 1990s on. Libraries and other information agencies (such as archives) have highly developed systems, skills, and techniques for information management, often built up over decades or even centuries. However, libraries and information agencies have not yet recognised fully how their users behave – for example what information they seek, when they seek it (i.e. at what point of information need they look for it), the places (physical and electronic) they go to seek it, the people they consult, how the information is meaningful, and how this relates to the way in which the information will be used. To ensure greater success in matching users with their sought information, further research is required. The *Matching Users With Information* group is concerned with three of these areas:

1. Identifying information needs
2. Improving information delivery systems
3. Ensuring the availability of information.

There is potentially a fourth area, information ethics.

1. Identifying information needs

First, it is necessary to know more about how different groups of users behave when they require information. Questions the group are addressing, or wish to investigate, include: Where do users seek information? Whom do they ask? What databases do they look at? How do they use existing databases? Are there cultural differences in information-seeking behaviour? Do younger and older users of libraries exhibit different information-seeking patterns? How are social networks incorporated in information seeking? How does the nature of the information environment influence information-seeking behaviour? How do different groups become information literate?

Members of the group are already working on some of these questions. Eyre is addressing the role of public libraries in encouraging reading development, and the use of databases in schools – how they are used, problems with their use, and how they prepare students for further education; some of this is collaborative research with the University of Wales, Aberystwyth. Higgins is examining barriers to reading for boys. Lloyd is addressing the nature of information literacy in workplaces, and how it manifests in groups in workplaces. Mills is continuing research into information-seeking behaviour, based on his doctoral research into the information-seeking behaviour of university academics. Three doctoral candidates are researching topics relevant to the theme of identifying user needs. The working titles of their research are *Successful Aging and Information Seeking* (Asla), *Knowledge Transfer (Creating, Sharing and Use) in a Learning Community: a Case Study* (Langford) and *The Impact of Baby Boomers on Public Libraries* (Lockyer-Benzie).

2. Improving information delivery systems

Second, the information delivery systems themselves need to be continually evaluated and improved, on the basis of increasing knowledge of how these systems are used. Questions the group are addressing, or wish to investigate, include: What is the likely future role of libraries of various kinds in information delivery, and in print and electronic publishing? How can our understanding of user behaviour assist system development? Are system designers finding a match between users' mental models of systems and the conceptual model behind the systems? Can existing methodologies for the evaluation of information systems be adapted to the evaluation of web-based information delivery systems? Can quantitative research methodologies be combined with user studies to measure the performance of information delivery systems? How do information users interact with systems, and how does their information searching behaviour change as a result? How can information retrieval (IR) systems offer more flexibility so as to accommodate more information searching styles? How can IR systems assist users conceptualise their information needs?

Members of the group are already working on some of these questions. Ferguson and Harvey (with Shirley Oakley, CSU's Director of Library Services and Mary Macaulay, CSU Library's Director Client Services) are addressing some through CSU's participation in the Systrum Project. Hider's research is addressing the interaction between systems and users, and is investigating the validity of new cognitive models of user system interaction. Kennedy is researching how changes in publishing are affecting libraries. A research student, now a member of the Community of Scholars, has recently been awarded a masters degree for research titled *Evaluation of Intranets: User Satisfaction as a Measure of Success* (Kelly).

3. Ensuring the availability of information

Knowing how to better meet users' information needs, and providing better systems to do this, are ultimately useless if the information being sought is not available. This is especially the case in an environment where information is increasingly produced only in digital form. However, digital information is very susceptible to deterioration or loss. Questions the group are addressing, or wish to

investigate, include: What information of significance is no longer available? How might we minimise loss of significant information? What new problems are raised by the increasing reliance in today's society on information in digital form, both 'born digital' and digitised from other formats? What strategies and techniques could assist us to ensure the availability of digital information? How do paradigms of preservation thinking need to change to accommodate digital information? Can thinking and practice from archives inform and lead to improved preservation practices in libraries?

Members of the group are already working on some of these questions. Harvey, Lloyd and Lodge are participants in *Australia's Memory of the World*, a UNESCO program, and are currently developing a methodology for it that is likely to be adopted by other countries. Harvey is working on the preservation of digital information with special reference to Australian practice (much of which is commonly recognised as international best practice). Doctoral candidate Wendy Smith is researching a topic relevant to the theme of 'Ensuring the Availability of Information'. The working title of her research is *Future Access: the Preservation of Business and Research Information with Special Requirements in Australian Wine Industry*.

4. Information ethics

A potential fourth area, as yet embryonic, considers the ethical implications of information use in today's society. Three members of this group (Harvey, Higgins and Ferguson) have discussed with Professor John Weckert (Centre for Applied Philosophy and Public Ethics (CAPPE) and the School of Information Studies) possible topics for research in this area. Charles Sturt University is the lead institution of CAPPE, an Australian Research Centre (ARC) Special Research Centre, and has an international reputation for its professional ethics research. Ferguson and Weckert have already co-published in the field of information ethics, including a refereed article in a leading international journal, *Library Quarterly*, in 1998.

The Community of Scholars, with CAPPE, was recently successful in an application to bring Professor Simon Rogerson to CSU as a Visiting Research Professor in 2005. Professor Rogerson is based at De Montfort University in the United Kingdom. He is one of the leading international figures in computer ethics and has recently been acknowledged for his outstanding contribution to the awareness of social implications of information technology. He will assist the Community of Scholars to develop further its research in ethics for information professionals.

Significance of the research area

The significance of the research in this *Matching Users With Information* area lies directly in its potential for improving practice in libraries and information centres. Ensuring the availability of information and better matching of users with the

information they seek, at the point and time when they need it, lie at the core of improving the relevance of libraries to the societies they serve.

Activities in 2004

The Community of Scholars' objectives include several that will be implemented in 2004. One is this paper. Another is an agreement with the Editor of the *Australian Library Journal* to devote all of one issue in 2005 to articles that will showcase the research this group is undertaking. Other journal articles will also result from the group's current research. We will also use the Community of Scholars to develop mentoring opportunities that will continue to enhance the development of a newly emerging library and information management research group, such as group peer review of research grant proposals and papers submitted for publication. A regular seminar series has been established and a research assistant has been appointed. Longer-term research projects involving several members of the group are expected to develop.

In the rest of the paper we highlight some of the current projects under way that come under the *Matching Users With Information* program. Specific projects are described and the methodologies used are indicated.

Current research: Overview of activities and interests

Members of the Community of Scholars are based in several states and territories of Australia, plus one in the United States, and have, collectively, expertise in a range of research methodologies. Their details follow.

1. Identifying information needs: Current research

Terry Asla (doctoral candidate) is conducting an ethnographic study, 'The Oldest Old: Information, Communication, and Successful Aging', which explores the relationship between the information behaviour of people aged 85+ (called the 'oldest old' in this study) and their perceptions of aging successfully. It examines four aspects:

1. Their primary information and communication needs
2. The extent to which they seek and acquire information needed to update their internal world models
3. The social networks and other sources through which they acquire this information
4. The importance of the Internet in their lives.

The research questions are examined through an extensive literature review and a qualitative empirical study of 32 residents from two U.S. retirement communities. The key technique applied is a semi-structured interview schedule. The results will be compared with results from a self-assessment of successful aging,

administered to the 32 residents. Contributions to the cumulative body of theoretical knowledge on the information behaviour of older adults will result.

Gayner Eyre (Lecturer, School of Information Studies) has previously worked as a researcher in the Department of Information Studies, University of Wales. Her research interests include information for lifelong learning, social aspects of information seeking and use, literacy and reading development, and literature and information services for young people. The main focus of her current research is *Smart Information Use in Schools: the Impact of School Libraries on Student Learning*, a three-year, three-phase project looking at the provision of information services within schools within the context of *smart* innovations in order to provide benchmarks and models of best practice.

This research is being undertaken with external funding from the Australian School Library Association. Recent publications and presentations relevant to the 'Identifying Information Needs' theme include:

- Eyre, G. (2003). Back to basics: the role of reading in preparing young people for the information. *Society, Reference Services Review*, 31(3): 219-226.
- Eyre, G. (2004). *Towards a literate Australia: the role of public libraries in supporting reading*. Paper presented at Challenging Ideas: ALIA 2004 Biennial Conference, Gold Coast, Queensland.
- Eyre, G., & Henri, J. (2003). *Information Literacy in the Curriculum: A Whole School Approach*. Final report of a consultancy at Scotch College, Melbourne, June-Dec 2001.
- Henri, J., & Eyre, G. (in press) Information literacy in the curriculum, *School Library Media Research* 7.

Susan Higgins (Lecturer, School of Information Studies) has conducted research in the areas of cross-cultural issues in education for library and information studies, education for knowledge management, the learning organisation, public libraries services to adolescents, and the value of print literacy in childhood and adolescence. She is currently researching the process of the public library reference interview with children. Since children are in the midst of developing intellectually, emotionally and socially, the difference in development between children and adults leads to a difficulty in understanding when communication is attempted.

Reference services to children deserve attention because children often have special needs that may be ignored during the provision of reference services to the majority of library users, who are adults. Because the provision of all programs and services to children needs to be based on an understanding of the various developmental levels that childhood presents, how these levels can be understood in terms of information needs, and how the librarian can respond to these needs appropriately will be investigated.

A recent publication relevant to the 'Identifying Information Needs' theme is:

- Higgins, S., & Alwis, G. (2001). Information as a tool for management decision making: a case study of Singapore. *Information Research: An Electronic Journal* 7(1) at <http://informationr.net/ir/7-1/paper114.html>

Linda Langford (doctoral candidate) has published papers with a focus on learning communities and information literacy in books, journals, and online as well as presenting keynote addresses and seminars across Australia and internationally. Her doctoral research, a qualitative interpretivist study within a constructivist paradigm, centres on how knowledge is created, shared and used in a teachers' learning community. It explores the dual concepts of learning organisation theory and knowledge management theory as they relate to a teachers' community of practice. In particular, it seeks to identify the structures and processes, barriers and enablers that distinguish how teachers create and share their new ideas, and what is needed to enable these new ideas to become incorporated into the new and evolving knowledge of the school.

Recent publications and presentations relevant to the 'Identifying Information Needs' theme include:

- Langford, L. (2003). The CAUL information literacy standards: A primary school interpretation, *Synergy*, 1(1): 42-47.
- Langford, L. (2003). The CAUL Information literacy standards: testing their operability within a primary school. In M. Nimon (Ed.), *Connecting challenges: Issues for teacher & children's librarians* (pp 106-112). Adelaide: Auslib Press.
- Langford, L. (2004). L'acquisition des compétences informationnelles: Quel paradigme? À qui la responsabilité? Est-ce que c'est important?, *L'Index Virtual*, 8. Available at <http://rtsq.grics.qc.ca/apsds/ECRITS/BULLETIN/index8/index8cul.html>.
- Langford, L. (2004). Smoko 'round the water-cooler: unbottling your colleagues' knowledge. In J. Bales & K. Bonanno (Eds.), *Constructing communities of learning and literacy: ASLA online Conference 2004 Proceedings* (pp 163-168). Zilmer: ASLA.

Annemaree Lloyd (Lecturer, School of Information Studies) is currently completing her doctoral research into workplace information literacy. Current research activities focus on information literacy in communities of practice, information literacy as a workplace competency, information seeking, and preservation of library resources. Lloyd also researches in the 'Ensuring Availability of Information' thematic area.

Recent publications and presentations relevant to the 'Identifying Information Needs' theme include:

- Lloyd, A. (2003). Information literacy: the meta-competency of the knowledge economy? An exploratory paper. *Journal of Librarianship and Information Science*, 35(2): 87-91.
- Lloyd, A. (2004). Working (in) formation: Conceptualizing information literacy in the workplace. In P.A. Danaher, C. Macpherson, F. Nouwens & D. Orr (Eds.), *Lifelong learning: Whose responsibility and what is your contribution? Refereed papers from the 3rd International Lifelong Learning Conference, 13-16 June 2004* (pp. 218-224). Rockhampton, QLD: Central Queensland University Press.

Lloyd's research is described in more detail in the Case Studies section later in this paper.

Maureena Lockyer-Benzie (doctoral candidate) is conducting research which has the working title *The Impact of Baby Boomers on Future Australian Public Library Service Provision*. This research aims to determine whether the needs and expectations of Baby Boomers are different from the needs and expectations of current ageing non-boomers (those born between 1924 and 1939). Any

differences will be explored to ascertain how these differences will impact on or influence Australian public library service provision in relation to resources, services and service delivery.

The primary data is generated from surveys, interviews and focus groups of Baby Boomers and ageing non-boomer users of the City of Swan Public Library Service within the City of Swan in Western Australia. The collected data will be used to determine a demographic profile of the Boomers, their future needs and how they differ from those born in the non Baby Boomer period.

Recent publications and presentations relevant to the 'Identifying Information Needs' theme include:

- Lockyer-Benzie, M. (2002). *Public libraries response to changing demographics in Western Australia*. Paper presented at Maturity Matters: International Federation on Ageing 6th Global Conference, Perth, WA.
- Lockyer-Benzie, M. (in press). Social inclusion and the City of Swan public libraries in Western Australia. *Health Information and Libraries*, 21.

John Mills (Senior Lecturer, School of Information Studies) carried out research titled *Information Seeking Behaviour of University Academics* for his doctoral thesis. A qualitative approach (mainly semi-structured interviewing of 30 academics) to collecting data was used and analysis of the rich and detailed data revealed that the affective realm was a strong motivator of information-seeking behaviour. Other key findings indicated that there was a positive image of information professionals in the academic community, the level of information-seeking literacy of academics was overemphasised and that a large range of factors determine the direction information seeking will take.

Recent publications and presentations relevant to the 'Identifying Information Needs' theme include:

- Mills, J. J. (2003). *The affective dimension: a key motivator for implementing service quality*. Paper presented at Library Measures to Fill the Void: Assessing the Outcomes, the 5th Northumbria International Conference on Performance Measures in Libraries and Information Services, Durham, England.
- Mills, J. J. (2004). *Qualitative measures for the evaluation of library services*. Paper presented at Performance Measures for Libraries and Information Services, Sydney, NSW.

2. Improving information delivery systems: current research

Stuart Ferguson (Senior Lecturer, School of Information Studies) has research interests in improving information delivery systems, and ethical issues. The interest in information delivery systems is part of a wider interest in the teaching and research of information and communications technologies in the library and information environment. He has been exploring the changing nature of communication between library and client, especially in academic libraries and in the fields of bibliographic and information literacy instruction. He is about to embark on further work on the development of reference and information services, especially virtual reference services.

As Director of the Centre for Information Studies, he is also interested in e-publishing. Another research interest is information systems research, which in

recent years has developed considerably and is being borrowed from by library and information management. He is interested in exploring the extent to which methodologies developed in the information systems area can be adapted to issues of information delivery systems in the library and information environment in order to improve services to communities of users. Ferguson also researches in the 'Information Ethics' thematic area.

Recent publications and presentations relevant to the 'Improving Information Delivery Systems' theme include:

- Ferguson, S., & HeBELS, R. (2003). *Computers for librarians: An Introduction to the electronic library*. Wagga Wagga: Charles Sturt University Centre for Information Studies.
- Ferguson, S. (2004). *The knowledge management myth: Will the real knowledge managers please step forward?* Paper presented at Challenging Ideas: ALIA 2004 Biennial Conference, Gold Coast, Queensland.

Ross Harvey (Professor of Library and Information Management) carries out research in this area, although his primary activities are in the 'Ensuring Availability of Information' thematic area. Recent work in the 'Improving Information Delivery Systems' thematic area includes a summary (with Hider) of bibliographic organisation practice, and work (with Dr Gaby Haddow, Curtin University of Technology) on the effectiveness of information dissemination in LIM.

Recent publications and presentations relevant to the 'Improving Information Delivery Systems' theme include:

- Fan, Q., & Harvey, R. (2003). The impact of broadband Internet access on the development of digital libraries in Australia. In Xu, Yinchu (Ed.) *Tu shu guan ke chi xu fa zhan yu chuang xin: Yan jiu wen ji* (pp. 258-268). [*Libraries continuously developing and innovating: research collection*] (Chengdu: Xi nan jiao tong da xue chu ban she) [South West Jiao Tong University Press].
- Harvey, R., & Haddow, G. (2003). How much professional literature do Australian librarians read? Disseminating information retrieval research results to Australian LIS professionals. *Journal of Education for Library and Information Science* 44 (3/4): 246-257.
- Harvey, R., & Hider, P. (2004). *Organising knowledge in a global society: Principles and practice in libraries and information centres*. Wagga Wagga: Charles Sturt University Centre for Information Studies.

Philip Hider (Lecturer, School of Information Studies) is following up his doctoral research with further development of a new methodology and a new model to apply to the investigation of user-system interaction during information retrieval. His research focuses on information goal redefinition through interaction with document retrieval systems. Hider is also involved in other user-oriented research, such as the impact of impact of metadata standards, and the development of measures of bibliographic quality.

Recent publications and presentations relevant to the 'Improving Information Delivery Systems' theme include:

- Harvey, R., & Hider, P. (2004). *Organising knowledge in a global society: Principles and practice in libraries and information centres*. Wagga Wagga: Charles Sturt University Centre for Information Studies.

- Hider, P. (2004). The bibliographic advantages of a centralised union catalogue for ILL and resource sharing. *Interlending & Document Supply*, 32 (1):17-29.
- Hider, P. (2005) *A new generation of transaction logging systems: a new era of transaction log analysis?* Paper presented at Information Online 2005, Sydney, New South Wales.

Hider's research is described in more detail in the Case Studies section of this paper.

Tricia Kelly (Knowledge Services Manager, CSIRO Sustainable Ecosystems) recently graduated with a research masters degree from Charles Sturt University. Her research interests encompass both the human and technical aspects of library service delivery. As manager of a geographically dispersed library team located in Darwin, Alice Springs, Atherton, Townsville and Canberra and working with clients located all over Australia and internationally, Tricia is particularly interested in improving service delivery through changes in technology. Having thoroughly enjoyed the technical aspects of her masters research into evaluating intranets, Tricia is currently heading a research team of library and IT staff investigating the delivery of library services via Personal Digital Assistants (PDAs) within CSIRO Sustainable Ecosystems.

Another research interest, supported by considerable first-hand experience, is exploring the continual, and often rapid, changes in the delivery of library services, the impact on the library profession and where change management fits into this equation. Of particular interest is the current and future development of the CSIRO Library Network, but it is anticipated that aspects of this research will be applicable to the broader Australian library profession and services.

A recent publication and presentation relevant to the 'Improving Information Delivery Systems' theme is:

- Kelly, T. (2004). Evaluating Intranets - key measures of success. Paper presented at *Digital Libraries and Information Services: Solutions for Cost-Effective/Efficient Quality Service Delivery National Conference, 24-25th June 2004* (pp. 221-237). Sydney: IES Conferences.

John Kennedy (Lecturer, School of Information Studies) has prepared, for the 2nd International Conference on the Future of the Book in Beijing, August 2004, a paper entitled 'Do today's students of librarianship need to know about publishing and distribution?' This argues that while the tendency not to give much attention to publishing and distribution in LIM courses is understandable, it is unfortunate, as without a knowledge of publishing and distribution in print and digital forms graduates will be less effective in optimally managing the resources they provide for their clients, and less well prepared for the likelihood that their professional careers will involve them directly in a role as publishers and distributors. He is also investigating the role of collection development policies and similar documents in an environment largely dominated by digital resources.

A publication relevant to the 'Improving Information Delivery Systems' theme is:

- Kennedy, J. (2002). *Collection management: A concise introduction*. Wagga Wagga: Charles Sturt University Centre for Information Studies.

3. Ensuring the availability of information: Current research

Ross Harvey (Professor of Library and Information Management) has long-standing research interests in the preservation of library and archival materials. His current research in this area focuses on two projects: the preservation of information in digital form, and the UNESCO Memory of the World Programme. The first of these investigates how Australian practice in digital preservation (often considered international best practice) can better inform activities internationally. Harvey is also a researcher in a group participating in *Australia's Memory of the World*, a UNESCO program. With Lloyd and Lodge, both members of the Community of Scholars, he is currently developing a methodology to identify Australia's lost and missing documentary heritage, one that is likely to be adopted by other countries. This research is attempting to address the question 'What information of significance is no longer available?'

Recent publications and presentations relevant to the 'Ensuring the Availability of Information' theme include:

- Harvey, R. (2003). *Preserving digital documentary heritage in libraries: What do we select?* Paper presented at Symposium 2003: Preservation of Electronic Records: New Knowledge and Decision-making, Ottawa, Canada.
- Harvey, R. (2003). UNESCO's Memory of the World Programme and Australia's lost and missing documentary heritage. *Australian Library Journal*, 52(2): 135-148.
- Harvey, R. (2004). *The preservation of digital documentary heritage: Lessons from Australian experience*. Paper presented at Made in Aotearoa, LIANZA Conference, Auckland, NZ.
- Harvey, R., & Howell, A.L. (2004). *Preserving the memory of Australia*. Paper presented at *Challenging Ideas: ALIA 2004 Biennial Conference*, Gold Coast, Queensland.

Harvey's research is described in more detail in the Case Studies section of this paper.

Annemaree Lloyd (Lecturer, School of Information Studies) is a participant, with Harvey and Lodge, in the Lost and Missing Documentary Heritage program of *Australia's Memory of the World*, a UNESCO program.

Recent publications and presentations relevant to the 'Ensuring the Availability of Information' theme include:

- Harvey, R., & Lloyd, A. (2004). Remember the last film search? *Museums Australia Magazine*, 12(2): 6.
- Harvey, R., & Lloyd, A. (2003, June). Australia's lost and missing documentary heritage. *InCite*, 13.

Damian Lodge (Lecturer, School of Information Studies) is a participant, with Harvey and Lloyd, in the Lost and Missing Documentary Heritage program of *Australia's Memory of the World*. He is also currently undertaking research in the areas of human resource management in libraries, specifically middle management, organisational culture and the issues affecting customer service staff and the services they provide. Other interests include managing innovation and creativity in an academic library, and business development. Damian is currently the Associate Director of the Centre of Information Studies and has a strong interest in e-publishing.

Wendy Smith (doctoral candidate) is researching the preservation of and future access to electronic information. Prior to returning to full time study, Wendy was a senior member of staff at the National Library of Australia, where she held a variety of positions involved with the preservation of information. These included Senior Manager of the PANDORA Project, with responsibility for establishing and managing an electronic archiving program for Australian web-based publications. Wendy's research interests are directed towards the development of general policies for and managing library and archive preservation programs. A particular interest is the impact that continuing developments in digital collections will have on future scholarly education and research.

A publication relevant to the 'Ensuring the Availability of Information' theme is:

- Smith, W.E. (2004). Wine on the Web: Australian wine information on the Web and its prospects for long-term preservation and access. *Australian Academic & Research Libraries*, 35(2): 111-128.

4. Information ethics: Current research

Stuart Ferguson (Senior Lecturer, School of Information Studies) has a long-standing research interest in ethical issues and has published in this field. One of the outcomes that he is currently working on is the application of the contextualist approach of the Hungarian literary and political theorist, Georg Lukács, to aesthetics to the area of ethics. He suggests that such an approach is far more appropriate than the somewhat abstract one taken in the profession and in academic institutions.

Case studies

One case study has been selected from each of the three primary areas of interest to the Community of Scholars and is described here, noting especially the potential relevance of this research to improving professional practice.

Case study 1: Identifying information needs

Annemaree Lloyd: *Working (in)formation: Conceptualising information literacy in the workplace*.

Lloyd's doctoral research aims, through an exploration of the information practices of firefighters, to conceptualise the nature and role of information literacy in the workplace. The overall research approach is that of a holistic exploration in which information literacy is envisioned as an important suite of practices that support and enhance workplace learning.

The research employs a grounded-theory method that is influenced by constructionism. This method aims at building a substantive theory that is representative of the lived experience of the group of firefighters who participated in the study. Data collection in the first phase of research consisted of interviews

that focused on identifying the significant categories which characterise firefighters experience with information.

The categories that emerged from the analysis of these interviews were further explored in a second round of interviews aimed at deepening the conceptualisation of firefighters' experiences with information in the workplace. As part of the fieldwork, observation of training sessions was undertaken to identify the communication practice between emerging and experienced practitioners which underpin the mediation of information within workplace practice. Throughout the fieldwork and during the writing up of the research, regular informal discussions between the researcher and participants took place about the phase one and phase two analyses. The aim of these discussions was to ensure that the final analysis was representative of the experience of firefighters who participated in the study. The outcome of the research is a model of workplace information literacy which may be used by other researchers as the baseline for further exploration, as well as the basis for a more generalised theory of workplace information literacy.

Lloyd argues that through exploring how information relationships and information practices are constructed and mediated, the meaning and shape of workplace information literacy can be determined. This places those who have an interest in understanding and fostering effective information literacy education in a better position to develop appropriate strategies that will acknowledge the complexity and specificity of information in the workplace. This in turn will contribute to the development of information literacy skills that meet the needs of the workplace, and enable greater transfer of information literacy skills in the transition from education to work (Lloyd, 2004: 223).

Based on this research, Lloyd suggests that the present conceptions of information literacy do not take into account the social processes which are involved in facilitating access to information, and which constitute an important aspect of becoming information literate. In the situation studied in this research these processes enable new firefighters to engage with the discourse and practices of their profession. Lloyd also suggests that our current conceptions of information literacy do not recognise the significant role of experienced practitioners in mediating, affording or even contesting information opportunities for emerging practitioners (Lloyd, 2004). Evidence from this research also indicates that, in workplaces, information access is not confined to the formal statements of work that are constituted through training and administrative materials. Learning about the practice of fire fighting requires new recruits to recognise information that is drawn from lived experience of others, and the actioned body, as an important information source and site of knowledge. In the process of learning to become a firefighter, emerging practitioners must learn to couple together and transfer abstract information with practised reality and to evaluate this information in the construction of knowledge.

The relevance of this research to practice lies in two areas. The first is its contribution to our emerging understanding of how information literacy underpins

learning in the workplace. The second is the role of information literacy in enabling the development of collective understanding, which is particularly important for groups who need to work collaboratively and develop collective competency. The research will also contribute to our understanding of information literacy by identifying the processes used by experienced practitioners which facilitate the development of information literacy practices in the workplace. The findings of this research will enable librarians to consider whether their current delivery of information literacy education has useful application in the 'real world' of the workplace, and how best to develop information literacy education which will assist with the transition from education to work.

An example of this reframing of the way we support information literacy in libraries may include the development of more student-based collaborative approaches to learning about how information is located within a landscape, and the development of collective understandings through team work. Based on this research, librarians involved in information literacy education might also consider the importance of observation and rehearsal as part of their own teaching practice, as these practices are dominant in the fire-fighting workplace.

Case study 2: Improving information delivery systems

Philip Hider: *User redefinition of search goals through interaction with an information retrieval system.*

Search goals of users of information retrieval systems have commonly been assumed to be static and well-formed before the search begins (Borgman, 1996). However, a significant amount of goal redefinition during real-life search sessions has been detected in Hider's research.

One study carried out by Hider examined user behaviour at a library OPAC. It showed that search results would quite frequently induce users to reconsider and revise their search goals, sometimes following up with a new search based on this revision. A more extensive investigation used transaction logs from the OCLC FirstSearch service to identify factors that affected the amount of goal redefinition taking place during a search session. Logged queries within search sessions were coded according to their conceptual differences or similarities, so that an index of redefinition could be constructed.

This kind of transaction log analysis was thus more interpretive than most, focusing on semantic content rather than on the syntax of strategy. It examined the nature of the goals behind the searching, rather than the strategy which led to zero hits, the take-up of particular search options, and so on. The coding was in effect a kind of content analysis, applying a complex coding system, with a chronological dimension. The resulting indices of redefinition for search sessions on different FirstSearch databases were compared in order to determine whether features of different databases might produce different levels of goal redefinition.

It was found that different databases produced different amounts of goal redefinition. Further analysis showed that the metadata displayed by a database

appeared to affect the frequency of goal redefinition, and that the presence of abstracts in results was a positive factor. Also a positive factor was the presence of descriptors and identifiers, perhaps because of the former's hyperlinking nature on the FirstSearch interface. On the other hand, no evidence was found to indicate that abstract length has much effect on goal redefinition, nor on hit rate or levels of precision and recall.

There are several implications of these findings for systems design, user education and user modelling. It is proposed that goal redefinition should be considered a positive result of system feedback, and that systems should be designed to facilitate it. Abstracts and summaries of documents should be presented to the user as frequently as possible, and a system's metadata should be hyperlinked as thoroughly as possible. Users also need to be educated about the importance of reviewing their search goals, as well as their search strategy. Moreover, information retrieval researchers need to bear in mind that system feedback can shift the direction of a user's search. A new user model of information retrieval has been constructed by Hider. In this model goal redefinition is shown as an important part of information acquisition, where purposeful searching and incidental encountering form a dialectical relationship, even during a user's interaction with an information retrieval system.

This research is intended to be followed up in various ways. The index of goal redefinition is to be further tested and developed, as is the new user model; more interpretative transaction log analyses will be carried out on other information retrieval systems, using screen recording software; and a wide range of other possible factors affecting goal redefinition are to be investigated.

In fact, research building on Hider's initial investigations is already underway. A screen recorder is being used to capture complete search sessions at computer terminals dedicated to online searching. This data will provide for a much sharper analysis of user-system interaction, with indication of specific causes of search behaviour, including search redefinition being observable as users select from result sets. Interpretation of the recordings will be triangulated with comments made by users during pre- and post-session interviews, and with protocol analysis of closed sessions. Another technique planned to provide insights into visualisation of system feedback is the recording of indicative mousing performed by predirected users. That is, selected users will be asked to highlight those elements of the interface that contribute to their decision-making – decisions which lead to what Hert (1995) might call situated action.

Case study 3: Ensuring the availability of information

Ross Harvey: *Preserving digital information: An Australian perspective.*

Ensuring the long-term preservation of information in digital form is now considered as one of the most significant challenges faced by the information professions. Action is needed to address the issues surrounding digital preservation – maintaining access over time to information in digital form. Harvey's research is aimed at identifying any guidance that allows us to get closer

to widely applicable solutions to the challenges of digital preservation, solutions that apply to both large and small organisations.

Harvey's *Preserving Digital Information* project is intended to develop a better understanding of current strategies for the long-term preservation of digital information and of Australian information management professionals' attitudes to the challenges of digital preservation. It specifically takes an Australian perspective, using Australian case studies and examples wherever possible. It is based on the contention that Australia exerts a major influence on the world in the digital preservation arena: Australian practice in digital preservation is often at the forefront of world best practice, and Australian experience is recognised internationally.

Data for this study comes in part from interviewing senior information management professionals about strategies currently in place for the preservation of digital information in Australian cultural heritage institutions. It also investigates their attitudes to future developments in this field. Those interviewed are in charge of preservation activities in their institutions or are active commentators on digital preservation, and come from the library, recordkeeping, audiovisual archiving, and geospatial communities.

The interviews pose a wide range of questions. First they seek views about the contention noted above. Next they ask about how the terms 'preservation' and 'archiving' are currently defined, then about changes in preservation practice as a result of the need to accommodate digital information. Further sets of questions ask about the relationship between digitisation and preservation, about selection of material for preservation, and about what makes an effective digital preservation strategy. Another set of questions asks about the threats and challenges to digital archiving and long-term preservation, and about who the stakeholders are. Finally, sources of information about digital preservation are asked about, and the questions: 'How we might be able to train digital preservation specialists? What kinds of qualifications might we expect them to have?' are posed.

This research is producing a detailed description of current Australian practice in digital preservation. By itself this is interesting enough. However, it also provides the possibility of improving practice. This is demonstrated here by considering the responses to two questions.

One question posed during the interviews was: 'What makes an effective digital preservation strategy?' This is asked because strategies are numerous, are still evolving, and they are not yet universally applicable. We are likely to see a small number of strategies emerging from the current bewilderingly large range. These interviews sought to establish what the characteristics of these strategies would be. Determining these characteristics could guide us to more rapid development of viable strategies. The interviews so far suggest provisionally that effective digital preservation strategy has the characteristics:

- A sustainable environment that supports digital preservation over time
- The building of digital preservation activities into normal operating activities
- Definition of what it is that we are trying to preserve, the 'essence' of a record
- Adoption of stable, widely used and clearly defined standards
- Building in sufficient management information metadata and preservation metadata
- Standardising of data formats wherever possible
- Recognition that digital preservation is an active process; keeping the data alive
- Avoidance of reliance on proprietary data formats or systems.

Another question posed during the interviews was: 'How long is 'long-term' in digital preservation thinking?' This question is worth asking because it assists us to determine the resourcing we might need to effectively carry out digital preservation. It also suggests some of the ways in which our thinking and our procedures may need to change. Responses to the question ranged from 30 years to 250,000 years. The respondents suggested some practical reasons why it was important to have a clear idea of how long. One argued it in economic terms: 'the return on the investment in digital preservation that we make for me has got to be of a 100-year plus time-span'. This length of time was also 'sufficiently long to get over the immediacy of some of the politics surrounding [digital preservation] and firmly establish it'. Another organisation had deliberately decided on 300 years, their rationale being that setting a specific period informed their current practice: 'to get to 300 years ... I have to do this, I have to do this other thing ... I need to take these actions now, or I need to find out what would be the appropriate action for me to take for it to be available in 300 years'.

This is preliminary material based on research in progress. The responses so far do not note much that is new. However, they place different weight on some aspects of what we supposed previously. For example, relatively little importance is placed on technical matters, perhaps suggesting that the IT issues around systems, equipment and software are considered on the way to being solved. The need to place digital preservation activities in an institutional context and to integrate them into that organisation's normal operating procedures is an area that received heavier emphasis than it would have in the past. These lessons come from large and relatively well-funded institutions. Harvey suggests that the real challenge is how to develop strategies and techniques that will allow the smaller and less well resourced libraries and archives to also successfully preserve digital information.

The 'Matching Users With Information' research in the national and international context

The three case studies are not, of course, the only examples of the kind of research that the *Matching Users With Information* group is undertaking, nor do they demonstrate the full range of methodological expertise possessed by members of

the group. They are, however, indicative of the potential for improving professional practice that research of this kind possesses.

Lloyd's research, and that of the 'Identifying Information Needs' theme, suggests how investigation into how users and groups seek and handle information allows us to understand better what actually happens, and shows promise in pointing out how current models can be refined and practices based on these models improved. Hider's research has the potential, if further developed to a stage where it is implemented in a system, to improve user satisfaction by providing better search results. Harvey's investigation of Australian practice in digital preservation, many aspects of which are acknowledged as world best practice, can indicate how to improve practice and more rapidly develop workable responses. None of these case studies are providing results that are applicable only to Australian practice; they are of potential application to international practice.

Conclusion

LIM is an intensely pragmatic profession. Some would say that it is too pragmatic, that the majority of its practitioners are not interested in learning about research in the field; they do not put effort into locating it, reflecting on it, and figuring out how to apply it in their practice. There is, too, a widely acknowledged mismatch between research carried out in the academy and that required by the professions, with the result that research results coming from the academic context are often not considered to be relevant.

The *Matching Users With Information* Community of Scholars at Charles Sturt University is an attempt to bridge this gap. It has been in existence for not much over six months, and is still defining its role. Its activities in the short term are aimed at developing a sense of community, on working together as a critical and friendly research group, and on establishing an awareness of it outside its host institution, Charles Sturt University. It will then be well positioned to secure funding that will allow it to carry out research that addresses some of the issues suggested by the profession.

'From tiny acorns ...'

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DISCUSSION

There was critique of term 'users' [*M McPherson*]. Some saw it as related to drug use and abuse of people and suggested we should move away from the term [*G Johanson*]. General debate ensued about various terms in use: clients, readers, patrons, and customers. These also have certain assumptions underpinning them. Some felt the term 'users' may imply intent rather than incidental discovery and formal, purposive behaviours. It is system- and institution- centric. It also does not include 'non-users'. Others disagreed and warned that we should 'change it with care' as it is suitable for our professional context and research. The strength of the profession is that it is 'user-centred'.

Other industries use the term 'user', for example marketing. Some only use the term when referring to a larger group, and use more specific terms such as students, researchers and staff. It was suggested that the term 'people' be used as an overarching term. Reference was made to the work of Heidi Julien <<http://www.ualberta.ca/~hjulien/HeidiNewPage.htm>> on 'users'.

The research focus of CSU is extremely relevant to practice [*M McPherson*]. Practitioners want to get research that can be put into practice immediately. Constant change is an issue. For example, current [ahem – older!] researchers and practitioners may not understand the information use of 'digital natives' (those who were brought up the digital environment). As a consequence we need to think outside the box in relation to research. We cannot assume that information use in the workplace will be different to people's personal lives as the boundaries between work, home and leisure are being blurred.

Hider's research backed up what we already knew already from experience, for example people formulating vague queries and responding to feedback from the search and search interface [*M McPherson*]. But do IT professionals and publishers know this, and are they engaged with the research in this area? [*R Harvey*] There is pressure to 'Google-ise' search interfaces which would remove the feedback that is inherent in formal, controlled databases.

Building a repository is like 'taking out a mortgage' [*R Harvey*]. We need to be selective about what we preserve. Librarians are taking the long view in looking at preservation for hundreds of years, whereas IT and business professionals can only conceive of a shorter time frame (i.e. 300 years vs. 30 years). The number of digital repositories was raised. There are subject specific repositories (i.e. the ALIA REAP database), site specific (institutions), and format specific (theses). It would be possible to place documents in all of these, and we need to examine the implications of this [*M.Middleton*]. Concerns were raised regarding the open access to research through a repository and the ease with which work could be plagiarised, but this is applicable for any format. The discussion ended with the warning that digital repositories are more vulnerable, it being noted that it is harder to bulldoze a library than it is to get rid of files on a server.