



# Strategic Plan 2008-2010

## Scanning the Environment

A paper authored in collaboration by the environmental scanning teams 2007

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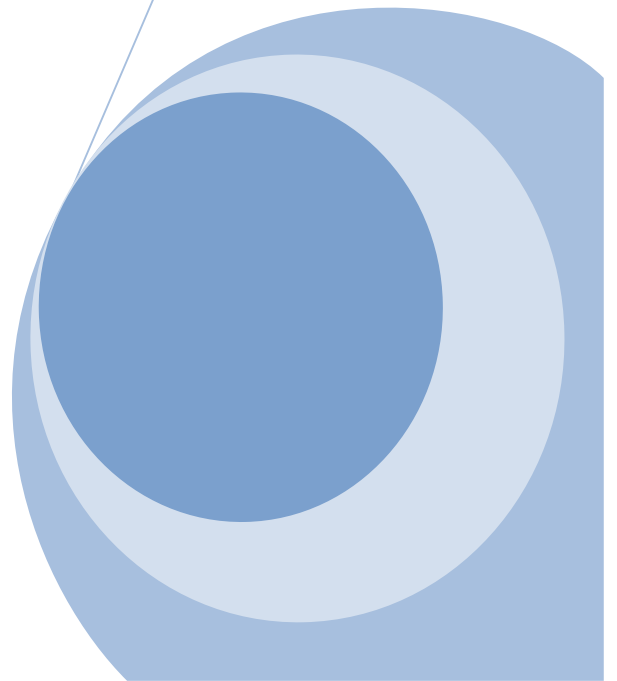
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# UWA LIBRARY ENVIRONMENTAL SCAN 2007

## SCANNING THE ENVIRONMENT

This environmental scan has been written with the UWA Library's past and current achievements in the forefront of our minds. Four teams were assigned to research in the areas of Teaching and Learning, Research, Information Resources and Users of the Future and Information and Communication Technologies Futures.

While these four areas created a useful frame of reference for the scanning groups, when the convenors met to share the work of their teams it became apparent that broader themes flowed through all of the nominated areas. Rather than repeat discussion of these themes under each of the four broad headings, it was decided to acknowledge the level of integration in the structure of the final document. It was felt that this was a truer reflection of the environment in which libraries now exist.

Finally, researching and writing this document has allowed us to reflect on what the Library has achieved in the last few years. It confirmed that much work towards the aims of the last strategic plan is currently underway and that this ongoing commitment needs to be recognised in the next strategic plan.

We hope you find this an interesting and thought provoking read.

## SETTING THE SCENE

### DIVERSITY AND GROWTH

The University of Western Australia enrolls the highest percentage of school leavers of any Australian university, 82% of enrolments in 2006. Currently, postgraduate students comprise 11.3% (research) and 12.3% (coursework) of the total population. The total numbers will increase as the University proactively seeks to attract additional students (currently 19,000 growing to 20,000 by 2010 and onwards up to 25,000). Growth areas will be, particularly, international higher degree research students and those entering by alternative pathways. We can assume, however, that for the next three years the predominant group will continue to be school leavers. The predicted total mix of the student population by 2010 is 12:12:76 postgraduate by research, postgraduate coursework and undergraduates.

The current UWA Course Structures Review will be looking at international trends towards a generalist undergraduate degree that allows for a broader educational experience which balances breadth and depth. This could potentially see students diversifying the focus of their undergraduate studies to a number of disciplines and could have a huge impact on the way in which students engage with our collections, our spaces and our staff.

## INTERNATIONAL FOCUS

“In order to build further upon its position of strength in research activities and in its undergraduate base, the University must maintain and strengthen its international focus, for it is the international world of scholarship that provides the quality controls and benchmarks by which the University will be judged in the long run. The University will best fulfil its role as a local and national resource, contributing towards State and Commonwealth needs and priorities and responding to 'consumer' needs, if it is internationally competitive and recognised.” (University of Western Australia, 2007). This feeds into the University’s aim to be in the top 50 universities world wide within 50 years.

This focus includes improving the experience of international students studying locally. Developing strategies to increase the level of interaction between International and Australian students, with the aim to improve international goodwill, will further strengthen the University’s international reputation.

## WHO ARE THE LIBRARY USERS OF THE FUTURE?

Born between 1980 and 1996, these commencing undergraduate students have been labelled the Net Generation (Net Gen), Gen Y, Millennials, iGen, or digital natives. A number of recent surveys from the UK, USA, Melbourne (JISC, 2007; Kennedy, Krause, Judd, Churchward, & Gray, 2006; Salaway, Caruso, & Nelson, 2007) and the UWA NODE Survey (Cluett & Skene, 2007) have identified a number of key characteristics associated with this age group. Of particular interest to the Library is their learning style preference which may be different from that of their older peers. The table below provides a summary of general characteristics found in the literature.

**Table 1: Gen Y characteristics**

<b>Positive characteristics</b>	<b>Less Positive characteristics</b>
optimism	team orientation –can prefer peer input rather than academic staff
familiar with technology	poorly developed critical skills
multitasking	Poor understanding of academic ethics
high expectations	reliance on web for info
diversity	lowest satisfaction of all generations with student experience
accept authority	Decision-making without thought of consequences

## INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTs)

### WHAT ICTS ARE BEING USED?

Two recent surveys provide data on ICTs currently being used by students. The results of the UWA Student Services Survey of first year students (Skene, Cluett, & Hogan, 2007) found:

- 95% of students surveyed have Internet access at home
- 90% are online more than once a day
- 96% own a mobile phone and 56% own a laptop
- 46% used instant messaging at least once a day
- 23% were blogging on a weekly basis
- 74% downloaded music
- 66% percent used You Tube

A survey of 27,846 North American students in 2007 conducted by the EDUCAUSE Center for Applied Research (Salaway et al., 2007) found similar results:

- 98.4% of respondents own a computer
- The average time spent online is 18 hours per week
- 81.6% use instant messaging (mostly daily)
- 41% use wikis, mostly weekly
- 80.3% use social networking sites such as Facebook (However, students “don’t necessarily think they have a place in the classroom” according to one of the ECAR authors. (Guess, 2007))

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### MOBILE WIRELESS AND PERSONAL – SERVICE DELIVERY ANYTIME ANYWHERE

The user studies mentioned above indicate that student ownership of mobile devices is high in undergraduate populations. At present students frequently own one or more devices, for example, MP3 players, mobile phones, laptops and PDAs. Students commonly bring their iPods, mobile phone and mp3 players on campus, but tend to leave their laptops at home.

Devices like the iPhone are bringing together functions of mobile phones, mp3 players, network connected web browsing and VOIP. These devices can connect to 3G networks, and to WiFi hotspots. With feature sets outpacing battery life, growing demand for the provision of re-charge facilities can be anticipated, perhaps with a need for access to the new standard micro-USB phone chargers in addition to the provision of power outlets.

Convergence of mobile technologies, 3G networks and Wireless Broadband can enable libraries to reconsider the services they provide to mobile devices. When smart phones are able to hook into the SNAP network on campus as iPhones in the US are doing at Starbucks, a new range of services are made possible. In the future, students may move seamlessly between 3G networks off campus and wireless networks on campus, and their expectations will move with them. Who will students turn to for support as they blur from one network to another?

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### WEB 2.0, 3.0 AND THE SEMANTIC WEB

In the last three years, one of the most striking developments in ICT has been the emergence of Web 2.0 technologies. Web 2.0 encompasses a wide range of tools which facilitate collaborative and information sharing activities. In many cases they are user-centred and user-driven and enable users to create their own content.

Web 2.0 technologies impact on higher education and libraries is expected to continue: “everything has changed, is changing, and will continue to change: students, faculty, research, the process of teaching and learning, and of course technologies. The implications of research 2.0, teaching and learning 2.0, and faculty 2.0 for campus IT leaders and organizations and both broad and deep” (Joel Hartman, Dziuban, & Brophy-Ellison, 2007).

The 2007 Horizon Report (*The Horizon Report*, 2007) has listed the following as “Technologies to Watch”:

- Social networking (Facebook, MySpace) - allows for the opportunity to contribute, share, communicate and collaborate. “Social networking sites not only attract people but also hold their attention, impel them to contribute, and bring them back time and again – all desirable qualities for educational materials” (*The Horizon Report*, 2007 p. 12).
- Virtual worlds (Second life) - provide a space or platform for collaboration – participants can engage in role playing and scenario building activities. “Virtual worlds offer flexible spaces for learning and exploration” (*The Horizon Report*, 2007 p. 18.). A number of Australian universities have established a presence on Second Life.
- New scholarship and emerging forms of publication (blogs, wikis, shared editing tools – Google Docs) Web 2.0 tools can be employed to create, critique and publish new forms of scholarship. This produces an inherent tension, “...to protect the integrity of scholarly activity while taking advantage of the opportunity for increased creativity and collaboration” (*The Horizon Report*, 2007 p. 21.) However, these emerging forms of publication provide an opportunity for wider collaboration and the possibility of reaching a much larger audience.
- “Serious games” – Massively multiplayer online (MMO) games allow for the possibilities of small or large group work, role-playing, mentoring, competitive team activities, collaborative world building (*The Horizon Report*, 2007 p.25).

Just as we are coming to terms with Web 2.0, Web 3.0 is on the horizon and it will be important for libraries to monitor developments in this area. Web 3.0, or the Semantic Web “is a grand vision for the future of the Web, as well as a collection of individual technologies to implement this vision...It envisions a shift from the current “Web of documents” to a future “Web of data”, where information is richly described in data structures [and] uses an array of technology standards, formats and languages (for example XML, Resource Description Framework and Web Ontology Language) to enable an idealized future” (Fenn et al., 2007 p. 26). “The Semantic Web will be characterized by more coherence, standards of description and interoperability...Further, if Web 2.0 is about social computing and interaction, the Semantic Web moves the web into a wide open, transparent space for all to carry out work and leisure activities” (Cho & Giustini, 2007).

## DO WE MEET THEIR NEEDS NOW?

The UWA Library currently offers a variety of high-touch and high-tech services to library users. The Ask a Librarian reference service, IRIS, Info Pathways, information literacy classes and the Study Smarter drop-in service (delivered by Student Services) are the most notable.

Since the previous strategic plan, the Library has also responded to and anticipated users’ needs by developing a number of initiatives including the LibQual+™ survey, Use of Building and Space survey, SuperSearch, UWA Portal Project, Wireless SNAP in all libraries, growth in current and retro ejournals collection, and Science Library planning.

A number of other UWA projects currently underway can be expected to bring new and improved services online during the life of the next strategic plan. Such projects include the Portal Project, Single sign-on, the new University web site, and the ITS Core Infrastructure project which will link services across the University.

## WHAT ARE THE CHALLENGES FOR FUTURE SERVICE DELIVERY?

### TEACHING AND LEARNING: NOT JUST IN THE CLASSROOM

The information literacy skills of post -1993 internet boomlets has not improved from past generational students. The need for skills of critical thinking, research and evaluation are increasingly required to make sense of this world where instant access to information of varying quality is readily available. (*The Horizon Report*, 2007)

#### THE STUDENT EXPERIENCE: ENGAGING THE STUDENT

An aptitude and capacity to undertake lifelong learning is outlined as one of the key competencies of university graduates. In his address to the Teaching and Learning Forum 2007, Professor Don Markwell promoted the idea that an engaged student is more likely to develop both the capacity and motivation to undertake lifelong learning than the unengaged. He spoke about the challenge of student engagement, that is, “the extent to which students are actively engaged in – actively committed to and actively involved in – their own learning,” advocating that:

- learning outside the classroom can be as important as – indeed more important than – learning within the classroom, and
- the most effective learning takes place within a learning community

The student learning experience is therefore not limited to planned instruction, or to an official syllabus. This is powerfully indicated in a recent study that showed four-fifths of students chose a situation or event outside the classroom as their most profound learning experience (Light, 2001) .

Professor Markwell (2007) outlines a strategy for encouraging student engagement as follows:

“We need actively to encourage, with deeds as well as words, student activities that reflect and promote student engagement – including a rich array of extra-curricular activities. Where these are activities that connect directly with studies – be they in music or languages, within the community or on exploratory expeditions, or much else besides – so much the better; but history shows that the full gamut of student activities ... are likely to contribute much to the educational development of those who take part in them ... Our campuses should be alive, if not 24/7, then pretty close to it.”

What is the role of the Library in relation to creating a broader, richer campus life and encouraging student engagement? It could encompass:

- Further utilisation of the Library as a space, both physical and virtual, to facilitate conversations and exchanges
- Increasing the visibility of our collections for students to read/listen/watch/discuss for their own personal interests outside the curriculum in areas such as fiction, film, music, newspapers, art, languages, travel, politics, current affairs, information technology, management, finance, environmental issues, philosophy, history, careers, sport etc.
- Collaboration with other parts of the university and the wider community to explore areas of synchronicity by which student engagement with the Library could be promoted i.e. Art exhibitions, discussion groups, book clubs. As an example: Art in the Library at University of Melbourne:  
<http://www.lib.unimelb.edu.au/collections/artinthelibrary/>

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## DIFFERENT GENERATIONS OF STUDENTS

The learning styles of different students will need to be accommodated. The publication *Engaging Gen Y students at university: what web tools do they have, how do they use them and what do they want?* (Skene et al., 2007) provides some interesting insights into generational differences:

They quote a Florida study that found the following differences in learning styles:

- Baby boomers (1946-1964) prefer face-to-face delivery of learning materials
- Gen X (1965-1979) want independence
- Gen Y want community and interaction.

“However, all had a similar view of how they defined excellence in teaching: they expected teachers to communicate effectively; to demonstrate genuine interest in student learning; to organise their course effectively; to show respect for students and to assess students fairly (J. Hartman, Moskal, & Dziuban, 2005 p. 11).”

In order to meet the increasing diversity of library students the Library needs to consider a “layered approach” to teaching delivery. This is a model of delivery that the UWA Learning, Language and Research Skills team developed which allows students to access information in a variety of ways that complement each other and that students can use in ways that best suit their situation or learning style.

For example, a skills package could be offered as a face-to-face lecture, recorded as a Lectopia recording with a variety of download options, made available on the web from a variety of sources and also offered in hardcopy for those who prefer to access information this way.

Not only does the layered approach address the various learning styles of Gen Y students, it reinforces the importance of combining the immediacy and personal nature of face-to-face services (service desks, appointments, workshops etc) with the flexibility and adaptability of online delivery (such as podcasts, RSS, forums and downloadable resources).

It should be noted that students and users of the future still have a strong connection to the Library as a physical space (particularly at UWA) and the evolution of different modes of

delivery should complement rather than replace the already high standard of face-to-face contact with students. The Library should therefore aim for aspirational practice in all forms of service delivery.

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### MORE INTERNATIONAL STUDENTS

A UWA survey of incoming international students conducted in February 2007 gave a strong indication that the University was doing a lot of things right in supporting international students. However, the findings also pointed to a need to further diversify and expand English language development services. Respondents nominated a high preference for these to be delivered via online workshops and tutorials. Respondents also indicated that regular meetings with lecturers were highly preferable as a supplement to online sessions.

The respondents expected that lecturers would provide whatever support was required for them to perform well. A high proportion of the students expected to be in the top 30 per cent of their cohort. Although international students expect they are going to be looked after and helped to pass, the University also expects students to be independent, critical learners and to prove themselves worthy of earning a degree.

The anticipated increase in numbers of international postgraduate students enrolling at UWA brings up several key issues for the Library to consider:

- Use of library resources require language skills – a different approach is required to teach these skills to international students whose first language is not English.
- Referencing is a challenge – many international students coming into post graduate programs are not up to speed with referencing – how to do it and the various styles that can be used. Do International students need a different, more personalized approach?
- Forming personal relationships with reference librarians is important to them, especially for help with specialised resources.

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### COLLABORATION AND THE LIBRARY'S ROLE

The Australian and New Zealand Information Literacy Framework (Bundy, 2004) is widely used to underpin Australian university library teaching and learning initiatives.

The framework recognises that incorporating information literacy across curricula requires collaboration between academic staff and librarians. Further, it acknowledges the importance of institution wide collaboration, specifying outcomes that are the responsibility of Library staff or academic staff (or both). However the delineation of responsibilities between academic and library staff is not clear.

Libraries should guard against attempting to teach skills that lie outside the expertise of librarians and would be better suited to academics. The Library's role should be confined to teaching only the following core information literacy skills:

- using the library and its resources;
- searching for information;
- evaluating information (sources);

- using (or citing) information legally and ethically.

Asher (2003) argues that “one of the most destructive trends in library science in the past decade has been the floundering effort to fit librarians into subject disciplines as teachers”. He continues “there are distinct boundaries that separate the skills of the academic and the librarian and it is their independence and interdependence, not their merging, which serves students best”.

Effective collaboration between academic and library staff is fundamental to the design and delivery of programmes that are embedded into course curricula so that students acquire the learning skills essential for quality learning. However information literacy is not an academic discipline and is most effectively taught by librarians provided that they do so in collaboration with academic staff.

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## TECHNOLOGY AND TEACHING AND LEARNING

Innovations in instructional practice and academic technology are now clearly moving higher education in new directions. The net generation will expect technology to be embedded into the learning environment. The current cohorts of students have grown up in a rich digital environment where technology is both transparent and ever-present.

It is predicted that academic staff will begin to use these tools in their teaching – referred to in the literature as “Faculty 2.0” (Joel Hartman et al., 2007). Who will be responsible for informing and up-skilling academic staff? “Emerging technologies are modifying the relationships between institutions and students, making the determination of quality teaching in higher education more complex and difficult” (Joel Hartman et al., 2007 p. 68). It is predicted that “Higher education IT leaders will be required to provide leadership in supplying information to the academic departments on the technologies that can be embraced to ensure the integrity of the institution’s brand, infrastructure and data security” (Zastrocky, Harris, Rust, Lowendahl, & Bell, 2006 p. 2). There is a significant divide between staff and student as “Faculty members think of technology as technology, students think of technology as environment. Faculty use technology as tools for presenting content. Students use technology as tools for exploring, communicating and socialising” (Joel Hartman et al., 2007 p. 66).

Higher education is inundated with ever-changing e-learning methods and strategies. It is important to take an iterative approach to implementation to determine which models produce quantifiable results and positive learning outcomes.

The priority when looking at the use of technology in teaching and learning needs to be to advance the instructional mission of the institution, with importance on matching solutions with identified needs. It is also vital to proactively identify tools and strategies before they are needed or required.

There is nothing to be gained by adopting a variety of technologies for teaching and learning with no regard for the pedagogy, sustainability, ease of use, ease of implementation and maintenance of the technology. We need to assess technologies and implement those that best meet the instructor and the student needs.

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## CREATING A CULTURE OF EVIDENCE

Higher expectations and the demand for accountability have led to the proliferation of reporting requirements from federal, state, accreditation, trustee and other governing boards.

How do we establish and support a culture of evidence and demonstrate improvement of learning?

There are a number of instruments available to help us establish evidence and demonstrate an improvement in learning. An issue for libraries is that to use these instruments and evaluate the results requires statistical expertise, a skill set that is generally not strong amongst librarians. If we are committed to evidence-based practice, we need to employ people or provide professional development in statistical analysis.

By evaluating information literacy and being able to demonstrate an improvement in learning we can ensure information literacy is continuously improved and meeting the needs of our clients.

## REFERENCE SERVICES

Reference services need to adapt to meet the ever developing demands of the Millennial generation who are increasingly self sufficient in terms of their information discovery and accessing behaviour (Burke, 2006). Reference services will continue to evolve with the increased use of new communication technologies, the uninterrupted growth of the Internet, the dramatic increase in availability of remote and full text databases, and the formation of non-library "help" services (Reference and User Services Association, 2007). The challenge for Libraries is to determine what reference services might evolve into. Current thinking is that reference librarians cannot simply wait behind a reference desk, physical or virtual, hoping readers will ask questions. Certainly innovative ways of taking reference services into reader spaces need to be considered to meet reader demands. However, what will these services be?

## RESEARCH: NEW WAYS OF WORKING

Changes are occurring at all stages of the research cycle. Facilitated by high powered ICT infrastructure, large scale international collaborations have become a dominant facet of the research methodology. Criteria for funding reflect this change as well as reflecting the desire to make research output accessible and re-usable through digital repositories. Effective management of the vast amounts of data being produced has become a top priority on global research agendas and peak research bodies.

The research process continues to move further into the virtual environment away from the physical and this is reflected at the library usage level.

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## CHANGES IN FUNDING

Funding for research is sourced from an increasingly diverse range of sources. These include Australian Research Council (ARC) competitive grants, discovery grants, Cooperative Research Centre funding and Federation fellowships to name a few. Consequently, research projects are more likely to be funded by several sources creating complex administration and reporting requirements.

Competitive funding continues to be closely tied to collaborative research centres involving multiple institutions and locations. Research projects involving industry and/or community groups are also attracting large amounts of funding.

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## THE RESEARCH QUALITY FRAMEWORK

Changes to distribution of university research block funding are currently occurring with the establishment of the Research Quality Framework (RQF). A new method of assessing research developed by DEST, the framework has been introduced to “ensure the public money is being invested in research of the highest quality that delivers real benefits not only to the higher education and research sectors but also the wider community” (Department of Education Science and Training, 2006 p.11).

The core basis of the framework involves an expert review process examining the evidence of quality in combination with a series of quantitative measures of the research impact such as impact factors and rate of publication in high impact journals.

The first cycle of the RQF will cover the period 1 January 2001 – 31 December 2006. Institutional submissions are due 30 April 2008 with the assessment stage to be by August 2008.

Despite the uncertainty of the RQF with the upcoming federal election, it is most likely that government assessment of research quality and impact in universities will continue in some form.

Issues raised by the RQF for consideration:

- By way of its criteria the RQF has mandated all universities to establish and maintain an institutional repository
- It will continue the current trend towards emphasising the collaborative aspect of research by forcing all academics to belong to a research group
- Impact of publicly funded research will be more accessible to all researchers and the community.
- Traditional scholarly publishing will be maintained as a preferred publication practice for researchers as the RQF links funding with publication in high impact journals. This is contradictory to another aim of the RQF of increasing open access to Australia’s research outputs.

Apart from the institutional repository, the library may also be called upon to support this process through citation analysis, copyright support and advice, providing support for access issues, and so on.

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## NEW WAYS OF CONDUCTING THE RESEARCH PROCESS

Collaboration, in particular, is driving changes to the research process. Increased IT capabilities have enabled research to be performed on vast scales, collaboratively and seamlessly across the world. This phenomenon known as “eResearch” or cyberinfrastructure is common across all disciplines and is enabling incredibly high powered, complex research

problems to be tackled. These approaches are linked to broader changes in the research process:

- Multiple teams in various international locations working more closely together, making timely access to data and resources crucial.
- Collaborative research is being facilitated by the use of virtual spaces such as email, discussion boards and chat rooms and Web 2.0 technologies.
- Scholarly communication between colleagues is becoming less formal, with networks and expertise becoming more accessible.
- Increased collaboration and integration of research agendas is resulting in the development of research projects that often involves more diverse parties from different disciplines.

These changes have important implications for libraries.

- Federated authentication solutions will become increasingly important and complex to ensure timely access to resources is delivered to a diverse and often inter-institutional group of authorised users.
- Demands on the Library may well occur earlier in the research process and will require services that are more dynamic and flexible. Such involvement may include facilitating spaces (virtual and physical) for scholarly communication or collaborative work.

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## DATA MANAGEMENT

Large amounts of data which need to be shared, manipulated, transferred, stored and restored are being generated by eResearch initiatives. This has resulted in complex issues related to the storage and retrieval of this data, including confidentiality and intellectual property. National and international research agendas are currently engaged in the development of protocols, infrastructure, authentication and training to support eResearch as well as manage the data being produced.

- Libraries have not traditionally been involved in the storage and retrieval of raw data. However, given librarians' expertise in information management, there is an opportunity for libraries to forge a role in this area as data curators (Gold, 2007). Management and use of this data and the related infrastructure will require significant upskilling for librarians. (There are suggestions of introducing a Master of Data Curation into Library Schools).
- For data that is not managed by the Library, the challenge will be to ensure our users can efficiently access this information. As the sources of raw data multiply within each discipline area, strategies need to be formed to ensure that our users can keep up to date with all current sources in their area of research.



**BlueNet**  
Australian marine  
science data network

Bluenet is an example of management of large datasets. Established to address the problem of marine data discovery and management, it allows deposition of all kinds of marine data into secure, professionally managed repositories that can be accessed through a purpose designed metadata system or web based portal that will allow cross datasets queries.

<http://www.bluenet.org.au/>

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## OPEN ACCESS

Arising as a response to the publishing crisis and made possible by the Internet and developments in ICT infrastructure, "Open access (OA) literature is digital, online, free of charge, and free of most copyright and licensing restrictions" (Suber, 2004 - 2006).

Reports suggest there are now over 2,500 open access journals (Swan, 2007) and numerous high profile OA projects operating such as SPARC, Public Library of Science (PLoS), BioMed Central and Springer Open Choice. OA articles are generally made available via an OA journal (peer-reviewed) or an OA archive or repository (not always peer-reviewed).

In recent times there have been signs that this publishing model has been growing in strength:

- OA is receiving significant support from governments in the European Union, Australia and United States as they strive to make taxpayer funded research publicly accessible (Examples include OECD Declaration on Access to Research Data from Public Funding, NIH policy in the US to provide free online access to peer-reviewed journals articles derived from NIH funded research and the predicted RQF in Australia).
- Universities are strongly encouraging and in some cases mandating their research staff to submit scholarly output into OA institutional repositories.
- Projects such as ROMEQ-SHERPA in the UK and OAKLAW in Australia have been established to provide guidance to authors on publisher policies about copyright and submission on items into OA repositories.

Despite OA's increased integration into the research process and scholarly communication, surveys recently conducted in the United Kingdom (Brown & Swan, 2007) (Brown, 2007) and United States (University of California & Greenhouse Associates, 2007) highlight low participation rates of researchers in OA activities. Reasons for this include:

- Varying levels of understanding and awareness of what it involves.
- Academic promotion prospects and future funding are still closely tied to publishing in refereed journals and traditional bibliometric citation analysis and less so to the broader dissemination of research.
- Concern for the sustainability of OA funding models and the possibility of publishing fees being transferred to the author. In a recent survey of OA publishers it was found that over 41% of their journals were experiencing shortfalls and 24% were just breaking even (Bergman, 2006).

- A fear that the quality of research currently managed through the peer-review process will decline in the OA environment.
- Minimal understanding of copyright and the implications of it in the OA environment.

As such, commercial publishing will remain a significant player in scholarly communication in the near future and will co-exist alongside open access initiatives. The challenge for libraries will be in:

- Integrating titles from both models into the discovery and location services for its clients.
- Determining the types of partnerships it needs to build and the type and level of advocacy it has to do in order to support OA publishing models.
- Providing guidance on copyright issues for authors involved in OA publishing.

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## DIGITAL REPOSITORIES

Digital repositories are continuing to grow in numbers across Australia and the world, predominantly in universities, state and national libraries. In Australia, this growth can be attributed to the increasingly closer ties to ARC funding and the depositing of research outputs in open access repositories and to institutions fulfilling the predicted RQF requirements.

Despite this growth, the uptake (both in populating and searching/retrieval) of institutional repositories by academics has been underwhelming (Brown & Swan, 2007; Davis & Connolly, 2007; Foster & Gibbons, 2005). Issues thought to contribute to this include:

- A general lack of awareness by academics about what repositories are and the existence of them in their institution (Brown & Swan, 2007)
- Complexities associated with submission and copyright implications
- Difficulties with version control of outputs
- Concerns related to OA as outlined in the previous section

Trends to affect the ongoing use of institutional repositories include:

- The discipline versus institutional level repository debate. (As funding and consequently usage becomes more important for impact measurement, larger institutional level repositories may become common with content harvested into smaller discipline based research repositories)
- Evolution of content in repositories beyond “traditional” scholarly publishing to storing data sets, scholarly interactive activities (wikis, blogs) (Walters, 2006) and developing profiles of expertise in universities
- Preservation and archiving of scholarly output is likely to be an increasingly important role of digital repositories

While generally accepted that there is a role for librarians in the management of repositories (Brown & Swan, 2007), the required knowledge and skills to perform this responsibility requires further consideration and planning. One such issue raised by Professor Doug McEachern at a strategic planning presentation is determining the level of subject expertise required to decide what content will be submitted into repositories – this is yet to be resolved.

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## CHANGES IN LIBRARY RESEARCH SPACES

“The role of the Library as a place in researcher’s working lives is becoming very different from what it traditionally has been” (Brown & Swan, 2007 p.19).

A recent survey of United Kingdom researchers found that weekly personal visits by academic staff to their affiliated libraries had decreased from 40% in 2001 to 22.5% in 2006 (Brown & Swan, 2007 p.19). This trend can be explained by:

- The ever increasing number of full text electronic resources available remotely to library users.
- Changing nature of the research process that is now more likely to be performed in the office or at home.
- Recent trends in the design of library spaces: Library spaces have become more student focused as reflected by the increased emphasis on collaborative work spaces and casual café style seating. The resulting noisy and social atmosphere in these areas of libraries is perceived as not conducive to “research type activities”.
- A changing perception of research staff that a library’s physical facilities are no longer essential to their work process.

The extent of the decline in these visits and this perception does vary from discipline to discipline. As expected, it is most pronounced in disciplines such as life sciences where the majority of research is journal article based (it is predicted in this survey that by 2011 just 9.5% life science researchers will visit their libraries at least once a week (Brown & Swan, 2007 p.20). The decline is less pronounced for researchers in the largely text based humanities. In 2006 48% of such researchers reported visiting their library regularly (down from 55% in 2001) as it contains “the objects of their research” (Brown & Swan, 2007). However, as primary resources in the humanities become available online, it is likely that perceived importance of physical facilities for humanities researchers will likely follow that of the researchers in the sciences.

Libraries have made considerable efforts to optimise the use of digital and special collections and it is clear that these initiatives are valued by researchers. However, cost of digitisation and the expertise required to create metadata of sufficient quality have hampered efforts to make potentially valuable research material held in special collections available to researchers. Despite these difficulties, such work can provide libraries with unique opportunities to collaborate with faculty researchers to facilitate the digital access of research collections.

The Uncovering New Chicago Archives Project (UNCAP) partnership with the University of Chicago Library is an excellent example of successful collaboration in which it “pairs faculty subject expertise

with library staff knowledge to identify collections that need to be preserved and to determine the repository that would best serve researchers and the collection” (Schreyer, 2007 p.5).

The Library’s role in providing a “place” for researchers is likely to involve increasingly virtual rather than physical places particularly as more research related services such as document delivery are offered online and digitisation of research collections advances.

## RESOURCE DISCOVERY

Libraries have traditionally been at the centre of the information seekers universe. They have provided large collections and a range of tools which have allowed users to discover resources within them. However, with the emergence of the internet as the dominant medium for the exchange of information, the Library has found itself as one among many information service providers competing for the users attention. Users now have the ability to discover and locate items from a range of services and increasingly they are exploiting these. In 2005 OCLC released the “College Students’ Perceptions of Libraries and Information Resources” report which indicated that 89% of college information searches begin with a web search engine as compared to just 2% which begin with a Library web site.

However, the report also indicated that college students had high levels of awareness and usage of Library electronic resources, although not to the same extent as the web search engines. Students may be starting their search on services like Google, but they are also at some stage using library based discovery tools. A similar study on the information seeking behaviour of researchers found comparable results. In short, one size does not fit all (*Researchers and discovery services: behaviour, perceptions and needs*, 2006).

For a more in-depth discussion of this see the Online Services Team’s Resource discovery paper.

While users may be choosing from a variety of discovery services, there is no denying the prominence of Web search engines. Their success is largely attributed to their familiarity to users and their ability to reduce the time and effort of the user in discovering and locating items. Many libraries and library vendors are now looking at what can be learned from this success in order to develop better discovery services for their clients and also to promote the wider use of their collections. Some of the key issues that have arisen out of this are:

Libraries need to make discovery simpler and easier:

- Library discovery services are fragmented and difficult to use. They need to be unified and simplified in the way web search engines are and yet still maintain the precision often required by researchers
- Staff and students use a variety of digital environments including iGoogle, MySpace, Facebook, and so on. Libraries need to identify what these environments are and push resource discovery services into them. As Karen Calhoun puts it “Libraries must be where the users eyes are” (Calhoun, 2007)
- In a recent paper put out by the British Library, it stated that “users expect to see networked library services that are in line with what they see elsewhere on the web” (Brazier, 2007). That is, they expect to see richer functionality than is currently on offer in Library catalogues and databases. The Library needs to take advantage of Web 2.0 technologies such as tagging,

reviews, book jackets, and facets to enhance the searching and browsing environment for its users.

Libraries need to make locating simpler and easier:

- One of the key frustrations of researchers is accessing sources and materials once discovered through a search (*Researchers and discovery services: behaviour, perceptions and needs*, 2006). Given that discovery is just as likely to happen outside the library as within it, the Library needs to expose its metadata and holdings into these services to make it seamless for searchers to locate and access content available through local collections. This will become of significant importance with major new initiatives such as GoogleBook, where only short passages from copyrighted books will be available and users will need to be redirected to local libraries or bookstores to obtain the item.

## WHAT ARE THE CHALLENGES FOR INFRASTRUCTURE?

### DEVELOPING THE RIGHT SPACES

#### PHYSICAL SPACES

The ability to serve readers who don't enter libraries has led some to question the future need for the physical library. Librarians have responded to this question by promoting the 'library as place'. The emphasis of library as place has seen concepts such as increased personal service and social interaction as demonstrators of the continued importance of physical libraries (Balas, 2007). The concept of an information commons as a communal space is an important one. A recent survey at the University of Southern California revealed that only 36.3% of the undergraduates surveyed use the library to check out a book and 12% of them come to the library to use print journals. In comparison, 61.3% come to use a computer for academic work (Gardner, 2005). The primary emphasis of information commons services is to provide for learners needs, as the evolving nature of the learner is clarified and assessed over time.

In order to facilitate the diverse needs of readers in relation to the Library as a physical space a number of new strategies need to be considered, especially in regard to providing areas which allow learning "outside the classroom". Flexible open spaces such as at the Glasgow Caledonian University's Saltire Centre have been reconfigured to allow for different activities and different noise levels (Watson & 2007). Café's and other social networking spaces such as art displays are other ways of improving the physical attributes of the Library. Particular consideration must be given to technology, namely creating a wireless environment that can be easily accessed by library users. Connectivity of physical spaces is also important as walkways and avenues provide excellent opportunities for social interaction within the Library.

With the number of students set to rise over the course of the next strategic plan it is anticipated that this will result in an increasing demand for computer facilities in the library. This maybe offset to some extent by the Library delivering some of its services to mobile devices. However, a lot needs to be done in developing these services. The UWA Library web site can currently be accessed via a portable device such as a mobile phone. However, as the

web site is not configured for mobile device navigation the display is poor and it is difficult to find information. In addition, services such as the Library catalogue are not accessible.

The Library's policy on covering the costs of internet traffic to education resources will continue to draw students in to use library facilities, though we may start to see a University wide approach to this which will enable student internet access from student labs as well.

The Library may choose to start providing software which meets the needs of students creating audio-visual content. With the proposed changes in the student population the Library may be the only place some students will be able to use some of the more expensive software packages.

While there is a lot of focus on the web based technologies which support collaboration, face-to-face student collaboration remains an important activity. In designing collaborative spaces technologies like projectors, wall mounted screens, team work software such as TeamSpot and equipment like the Microsoft Surface could be incorporated.

The Library is also a workplace for staff. One of the Library's key values is cooperation in the way staff work together. It is important that the Library provides sufficient and functional spaces with access to the necessary technology to allow staff both within and across Sections to perform in this collaborative way.

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## VIRTUAL SPACES

With online resources and new technologies, libraries interested in enhancing user services and providing unmediated access to library services and collection have begun to look at new ways of creating online communities, often referred to as virtual commons (Kajewski, 2006). For virtual commons to be successful, provision of appropriate technology is of paramount importance. This technology must allow for collaborative learning and virtual space sharing. Tools that support the creation of online communities include blogs, wikis, RSS feeds and aggregators, SMS, podcasts, web conferencing and instant messaging.

## DEVELOPING PEOPLE AND PROCESSES TO SUPPORT AND ENABLE RAPID CHANGE

Libraries operate in a highly dynamic environment and in the last few years, a significant number of ICTs have emerged that provide new and innovative ways of communicating with readers. This will continue to be important as "the increasingly vast array of online information, social networking websites, digital media, and other online resources has greatly increased opportunities for informal learning, leading to an environment in which learning opportunities outside the classroom may far exceed those within" (Joel Hartman et al., 2007 p. 66).

There are some significant differences in some of these ICTs compared with traditional library systems as they can be setup and customised without extensive information technology skills. The desire to implement and use these tools can be driven by anyone and "one of the biggest challenges to corporate Web 2.0 use is that demand generally bubbles up from users, while in the traditional corporate paradigm, upper management decides what tools workers should use" (Havenstein, 2007).

Libraries will need to be active in the following areas if they are to anticipate and quickly adjust to technological change.

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## MONITOR TECHNOLOGICAL DEVELOPMENTS

Library staff will need to actively monitor developments in emerging technologies. This includes the opportunity to experiment and understand technologies to determine whether there is any potential to enhance services. This could be achieved by creating a space on a server / laptop to download and experiment with programs or by using “sandboxes”.

“Increasingly, faculty members will download and experiment with free and inexpensive applications for digital delivery — outside of institutional awareness — to support their instructions, rather than waiting for institutional decisions”

(Zastrocky et al., 2006 p.2)

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## CRITICALLY EVALUATE NEW TECHNOLOGIES

Library staff will need to have sufficient skills to think critically about new technologies. “The academic library of 2012 will need a team of flexible experts, all with different aptitudes and specialisations but who collaborate as researchers, technologies and proactive members of the university community. The journey to Library 3.0 will involve working through the main drivers eg. next generation staff and customers, technology; while overcoming the barriers which include an ageing/retiring workforce and challenges of an inter-generational workforce with the application of appropriate and innovative responses” (Saw & Todd, 2007 p.3).

Given the challenges faced by library staff in keeping up to date with professional development, a further challenge to consider is our role in keeping academic staff up to date with their continuing professional development in relation to information skills.

Although much of the emphasis has been on student use of Web 2.0, increasingly a range of Web 2.0 tools are being adopted for staff use. “Enterprise 2.0” – sometimes referred to as “Groupware” - offer efficiencies for collaborative teams and projects. It is essential that this is considered as “Reticent companies ignore the [Web 2.0] movement at the peril of their competitiveness. Within a few years, rich, collaborative software platforms that include a slate of technologies like wikis, blogs, integrated search, and unified communications will be the norm. Employees will expect to work that way, and it’ll be up to IT to solve the still significant problems and deliver” (Hoover, 2007).

It may also be necessary to integrate these skills into position descriptions as “the repositioning of library tools, resources, and expertise will require staff resources and some new investments. For most libraries the staff will require technology skill sets that are not possessed by current staff. It is not clear if the best strategy will be to train existing staff, hire librarians who have the required skills, or to hire technologists and instructional designers. I suspect some combination of the latter two approaches will be most successful” (Lewis, 2007 p. 14).

It will be of benefit to establish and develop key relationships, both formal and informal, between staff in IT and other areas of libraries.

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## RECRUIT, DEVELOP AND RETAIN TALENTED STAFF

Libraries are adopting a competency approach to manage their human resources which outlines the knowledge, skills, and personal traits that enable library staff to function effectively in the tasks considered essential in the profession (Auster & Chan, 2004) (Auster & Chan, 2004). A study of job advertisements for library positions in Australia has shown that a shift has emerged towards generic skills and behaviours, rather than a specific skill set (Kennan, Cole, Willard, Wilson, & Marion, 2006) (Keenan & Cole, 2006). Position descriptions are also approaching the Library from a holistic view rather than emphasising a particular expertise, and capability statements favour personal over technical skills. However, the skill set required 'on the job' is increasingly expanding.

Libraries will need to work at retaining, developing and recruiting talented staff. In recent times the employment market has changed as the economy has boomed. Margaret Seares noted in her address to Library staff that the University is finding it difficult to retain and recruit professional staff in a number of areas.

As industry offers skilled professionals increasingly lucrative contracts, the public sector must look to those areas in which it can compete. Plans to review its HR processes and policies to increase flexibility may assist. Following industry trends the Library's own IT section has experienced a drop in female representation in ICT in the last few years, despite the University's long standing as a National Employer of Choice for Women. This increases the differential between the two heavily gendered professions of librarianship and IT.

A lack of staff with the appropriate skills has the potential to impact significantly on the University and Library's ability to pursue some of its strategic goals. These issues are not exclusive to the University, but impact equally on our software, hardware and service suppliers.

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## CONTINUING PROFESSIONAL DEVELOPMENT

The evolving role of librarians as educators requires skills in reference provision and collection knowledge, but now also incorporates knowledge and skills in instructional design, web authoring, marketing and project management, pedagogical theory and outcome based learning as well as subject-based skills and expertise. Librarians are expected to keep abreast of the latest technological changes, products, services and acronyms – and still be able to change a toner cartridge.

“Of the many challenges faced by the new academic librarian the balancing of job responsibilities and professional development activities may be the most daunting. In the fast paced world of academic librarianship it seems almost impossible to keep up with the change. Yet this has become both a mandate and an expectation ... In addition to these demands the new academic librarian is expected to become involved with professional development activities ... to give back to the professional community through extra-curricular activities and publishing”

(Flatley & Weber, 2004 p. 488)

The most obvious barrier to continuing professional development is then simply the sheer volume of current activity and lack of time, however additional challenges for librarians have been identified;

- Growth in part-time employment
- Greying of the profession
- Decreasing relevance of formal education to on the job work
- Proliferation of discussion lists, journals, conferences

As well as formal, structured professional development activities like courses and workshops, a survey of librarians found that informal professional development activities such as reading professional literature, attending meeting and conferences, professional networking, cross-institutional projects and visiting other libraries were rated as more useful (Auster & Chan, 2004). Suggested in house activities are knowledge exchanges, job rotation, testing of new products and services, mentoring programs, benchmarking and action learning. Self-directed courses are becoming increasingly popular such as the “23 Things you can do to learn about Web 2.0” course which has been adapted for use by some Australian academic libraries (<http://plcmcl2-things.blogspot.com/>).

Questions that emerge are: whose responsibility is continuing professional development? To what extent does it lie with the institution or the individual? To what extent can the institution assist the individual in their personal professional development? How do we add new competencies at the speed demanded by the user’s preferences and behaviour?

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#### REVIEW PLANNING PROCESSES TO ACCOMMODATE RAPID CHANGE

The Library may need to review its operational planning process in order to respond more quickly to implementing changes relating to new technologies. In the recent review of the Library (2006), one of the recommendations was to “Take steps to ensure sufficient flexibility in resource allocation to enable the exploration and development of initiatives outside approved operational priorities”.

However, it is important that Library staff recognize that IT resources are not endless and that prioritising is an essential part of the process. This should be transparent to all staff in the Library who should have an opportunity to be involved in the prioritising process. “If the best potential of the internal IT organization is to be reached, its staff must have trust in the institution's ability to define and prioritize IT services based on real needs and not only “nice to haves.” This is an important part of the ability of the IT organization to be effective and efficient, which is emphasized in an environment of scarce resources” (Lowendahl & Bell, 2006 p. 3).

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#### MANAGE HARDWARE PERFORMANCE AND CAPACITY

Libraries can enable timely evaluation, testing and implementation of new technologies by ensuring supporting infrastructure is flexible and has sufficient capacity for growth.

The IT industry has seen a recent drive towards server virtualisation and storage area networks (SAN) in the last few years, giving the ability to more quickly provision servers and storage without delays associated with the purchase, delivery and installation of hardware.

Sufficient backup and network infrastructure are also essential to allow for potential growth. Capacity planning and change management processes need to be utilised to ensure that the infrastructure retains the flexibility required to enable rapid change. The ability to monitor the performance of systems is essential in predicting what changes to infrastructure may be required into the future. The Library has invested in server virtualisation, a Storage Area Network (SAN) and an enterprise backup solution in recent years. Effective performance and network monitoring solutions would enhance the ability to manage the IT infrastructure in a way that will support the rate of change we can anticipate for the life of the next strategic plan.

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#### ADOPT VALUE ADDING MANAGEMENT PRACTICES

IT Infrastructure Library (ITIL) management best practice is generating interest in many areas of government in Australia and some areas of the University. Careful consideration must be given to ensure any adoption of such practices adds value without unnecessary overheads. IT management will drive to adopt only those models most appropriate to the Library and University.

### CAPITALISING ON ICT

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#### FUNDING IT

Funding IT is the top ranked issue in the Educause Report, "Top 10 IT issues 2007" (Camp & DeBlois, 2007) for the fifth year in a row. As highlighted in the presentations made to Library staff by the University Executive, funding for infrastructure comes from the University's unrestricted income. While this funding is decreasing proportionally, the user expectations of IT services and availability are growing. The demands placed on ICT services will also be affected by the planned increase in student numbers, as outlined in the University Strategic Plan, updated April 2007.

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#### BROADBAND

Broadband take-up continues to grow in Australia, but the country still lags behind other OECD countries in the provision of a national broadband network (17<sup>th</sup> place). There is as strong a need for an effective broadband network to support education and modern curriculum as much as it is needed for business. Broadband coverage is either incomplete and/or uneven in capital cities, with rural and regional Australia not being adequately covered. Broadband bandwidth and speeds are improving but are still inadequate for fast data transfer. Government progress is affected by regulatory issues, and the role of private sector participation in building an enhanced network is still being resolved. Broadband costs remain relatively high.

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#### PRIVACY LEGISLATION/ PRIVACY STATEMENTS

Privacy protection is a significant community theme and will continue to affect libraries also. The Australian Law Reform Commission has released in September 2007 its Review of Australian Privacy Law. Sections of the proposed legislation (2008) refer specifically to

developing technology, telecommunications, and research, all of interest to academic libraries. Because rapid advances in technology affect how information is gathered, stored and communicated this legislation is of particular interest.

The trend is for university libraries to have their own client-focussed privacy statements. It will be an opportune time to consider a new library privacy statement when the proposed legislation is forthcoming.

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## GREEN IT/GREEN OFFICE

There is worldwide pressure for IT and facilities managers alike to reduce their energy costs and energy consumption alike. New industry standards are emerging for data centres and computing equipment which all emphasize the need to “go green”. Promoting best practices for data centre power management and PC energy consumption will continue to filter down to library and office level. Recycling PCs and other electronic equipment are helpful but will not be enough.

Controlling power and cooling costs as well as providing power-efficient PCs and servers can reduce escalating energy costs. New energy-efficient PCs however can be expected to initially cost more than their less-efficient counterparts.

While local ‘green office’ initiatives are growing, libraries and/or their parent universities can expect to be drawn into cooperation with organisations such as ‘Australasian Campuses Towards Sustainability’ (ECU, Monash and UNSW are members). ACTS is the primary forum for sustainability in this region’s tertiary sectors and its mission is to promote the integration of the principles of ecologically sustainable development (ESD) within the curricula and operations of this sector.

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## OPEN SOURCE SOFTWARE IN HIGHER EDUCATION

The debate over Open Source vs commercial software can be expected to continue in higher education. At UWA there is a mix of Open Source and proprietary software in use. The Library has traditionally selected commercially available packages, but has routinely included Open Source packages in its evaluations of new software over the last few years. Open Source software will continue to be carefully considered when looking at new systems, while balancing the upfront and ongoing costs of Open Source and proprietary software. As noted in the recent Resource Discovery paper, a new mix of IT expertise may be required should the library tend towards using and developing Open Source solutions.

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## SECURITY AND BUSINESS CONTINUITY PLANNING

IT Security and Business Continuity Planning remains one of the top ten issues concerning ICT (Camp & DeBlois, 2007). The need for a set of documented privacy and security policies is emphasised, as is the need for a formal incident-response plan and the associated tools for incident detection.

As SOA and Federated Identity Management take off, information stewardship takes on increasing importance in ensuring that privacy and security concerns are considered and addressed at all levels. The term Disaster Recovery is increasingly being overtaken by Business Continuity Planning as IT and Business increase their alignment.

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## RAPID UPDATING OF SOFTWARE BY VENDORS

In this time of rapid change, many software vendors are responding to growing user expectations by providing software updates on a monthly or bi-monthly cycle. These updates then need to be tested and applied by local IT staff. This increased involvement in maintaining existing systems and services reduces the time available for investigating, developing and implementing new systems and services. In turn this limits the local ability to respond rapidly to changing user expectations.

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## SERVICE ORIENTED ARCHITECTURE (SOA)

SOA or Service Oriented Architecture is emerging as a way of the future for software and service integration. In essence SOA facilitates the creation of small modular services which can be made available to applications regardless of software platform or programming language. According to a Gartner report, "SOA is a durable change in application architecture, like the relational data model and the graphical user interface...SOA is an essential ingredient in strategies that seek to enhance the agility of a company" (Fenn et al., 2007 p. 28). The University Portal Project represents a critical first step towards SOA at this University.

The application of SOA in a university environment means that a service may be developed in one unit, but may be used by other units of the University. This decentralised structure raises questions as to who develops these services, and how that development is funded. Another Gartner report suggests, "Implementing SOA is a sound strategy to achieve the agility needed for an IT infrastructure to enable change rather than impede it. It is especially well suited for higher education institutions' cultural style, because services can then be implemented on an incremental basis without broad consensus-driven decisions" (Lowendahl & Bell, 2006 p. 4).

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## BRINGING ORDER TO INFORMATION RESOURCES

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### METADATA

As information environments proliferate and become increasingly dispersed through the web, metadata will act as the thread by which they can be woven together. It will also be one of the key elements required to facilitate the retrieval of more manageable and meaningful search results. As such, accurate, relevant, and structured data will be critical.

The streamlining of MARC record creation which has taken hold in the last 3-5 years will continue to develop with an emphasis on making the process cheaper and quicker. Some of the ways that this might be achieved include greater outsourcing of the creation of MARC records, accepting copy with fewer modifications, using non-MARC data to create MARC records for specific collections, and technological progress in tools to support the automatic creation of metadata.

With the library's collection expanding to cover new types of content such as digital repositories, librarians will need to be proficient in new metadata schema such as Metadata Object Description Schema (MODS) and Encoded Archival Description (EAD).

"We expect the very definition of cataloguing to evolve as well over the next five years from that of "creating MARC records" to something more akin to "creating metadata in diverse environments"

*(A white paper on the future of cataloguing at Indiana University, 2006 p. 11)*

One of the significant changes to cataloguing practices will be as a result of the implementation of the new Resource Description and Access (RDA) rules in 2008 which is the successor to AACR2. These new standards have been built around many of the principles outlined in the 1998 IFLA Functional Requirements for Bibliographic Records (FRBR) report and further the trend of separating the description of the content of an item from the description of the way the content is presented (ie book, ebook, video, and so on).

"RDA may permit or encourage catalogers to place less emphasis on rigid data formatting (for example ISBD punctuation) in favor of greater emphasis on the actual usefulness of the data to patrons"

*(A white paper on the future of cataloguing at Indiana University, 2006 p.11)*

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## NEW MODELS OF PUBLISHING

Commercial and academic publishing is embracing digital formats by incorporating new visualisation tools for representing data and incorporating interactive elements into the content. Ebooks are increasingly seen as dynamic publications which respond more quickly to changing information. In response, traditional books are increasingly accompanied by websites, wikis, and other mechanisms which facilitate discussion and update of knowledge (*The Horizon Report*, 2007). As Paula Berinstein puts it "The book is now a place as well as a thing" ([www.infotoday.com/searcher/nov06/Berinstein.shtml](http://www.infotoday.com/searcher/nov06/Berinstein.shtml)) where readers can gather, discuss and share responses and ideas.

However, the ebook is yet to make any significant inroads as a preferred medium for readers. Computerworld magazine recently named them as among the 21 biggest flops ever. The reasons for the low take up are varied and include poor pricing models, lack of adequate content, and the failure of any electronic reading devices to be convenient and portable enough to entice readers away from the printed version. Much of the future of the ebook is now seen to be hitched to the emergence of smart phones which offer the potential to deliver ebooks in a more convenient way.

Libraries will face an increasing number of scholarly communications which fall outside what is traditionally collected or described in the library catalogue. What is the Library's role in identifying, describing, and providing access to these?

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## PRESERVING DIGITAL CONTENT

Increasingly large parts of the Libraries collections are digital and are being stored and accessed via third party retailers. This exposes the Library to potential loss of substantial parts of its collection should any one of those third parties cease operation, incur sustained technological difficulties, or remove content from their site. In response to this a number of international initiatives have emerged which have begun to address both the issues of long term preservation of digital collections as well as emergency or backup access. Two such initiatives are Portico and CLOCKSS. These services are building digital archives on behalf of member Libraries who then have access to the archives after “trigger events” occur involving loss of access via the third party. The Library needs to determine to what extent it will join with these types of initiatives and how the associated costs for them will be factored into the Library’s budgeting plan.

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## ACQUISITION

Big Deals, while much maligned by Libraries, are still proving to be a popular model for acquisition. This is largely due to the fact that they have allowed libraries to expand their serial collections exponentially with only a marginal increase in overall expenditure. Within the Australian context the expansion of the Big Deal has been against the backdrop of favourable exchange rates over the past several years. To what extent the collective impact of all of these deals may have on a Library’s budget and purchasing in an unfavourable exchange year remains to be tested. Some modelling of these impacts and contingency planning may be prudent.

Publishers and agents have in recent times realised the benefits in developing services which assist libraries integrate purchased information resources into their processing workflows and integrated library systems. This trend is set to continue with further progress being made on two fronts:

- Vendor systems will further develop to make it easier for those involved in selection to keep up to date with new publications in their discipline. These offerings will take advantage of web 2.0 technologies like those used in Amazon such as relevance ranking and automated analysis which recognises patterns in user preferences and recommends additional titles accordingly. Selectors will be able to order directly from these tools and these will be seamlessly integrated into the Library’s ILS system for processing.
- Commercial publishers now have extensive online collections. Some publishers are now making it possible for libraries to expose these collections through their catalogues and provide the Library the ability to purchase items at point of use. This model switches the collection development process to a user driven one and expands the coverage of the catalogue.

## TECHNOLOGIES TO WATCH

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### IPV6 BY 2012

The new internet addressing system, IPv6, allows the number of uniquely identified internet connected devices to grow past their current limits. In the “10 year Strategic Vision for the Australian Information and Communications Technology Sector”, the National ICT Industry Alliance (NICTIA) includes a vision of Australia being one of the first countries to gain benefits out of implementation of IPv6 (expected by 2012). While no immediate action is required, the Library will need to ensure that it does not make any decisions which will preclude moving to IPv6, including careful selection of hardware and software.

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### 3D PRINTING

Although it sounds like something out of science fiction, 3D printers are emerging which print layers of resin, plastic or metals to create a three dimensional objects. Don't expect to see 3D printers appearing in libraries in the next 12 months, but who knows where this technology might take design intensive disciplines like engineering or architecture. Perhaps 3D printing will offer a new revenue stream to replace 2D printing and copying.

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### EXPERTISE LOCATION AND MANAGEMENT

ELM enables the capture and re-use of information about who knows what in an organisation. It might be used to locate the people in an organisation with a special set of skills, language abilities, interests and experience. It takes the organisational chart into the digital age in the interest of enabling and enhancing collaboration. Enterprise 2.0 technologies can be used to feed into ELM and increase staff effectiveness. Issues of privacy are key to successful use of these technologies.

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### PORTABLE PERSONALITY

Portable personality takes the next step beyond online bookmarks and search preferences, bringing with it individualised applications, user data and desktop settings. It will allow users to take their settings and preferences from one system to another unrelated system. In a university setting this could mean having the same environment available at home, on a laptop, in the lab and on library computers, all populated by information stored on their smart phone, an iPod, or a centralised server. Portable personality is not a set of technologies which are ready for implementation, but this is a technology to watch over the coming years.

## KEY ISSUES

### TEACHING AND LEARNING

- The Library needs to collaborate with the University in creating a broader and richer campus life that encourages student engagement and lifelong learning.
- In order to meet the increasing diversity of students the Library needs to consider a “layered approach” to service delivery which allows students to access information in a variety of ways that complement each other and best suit the student’s situation or learning style.
- With increased numbers of international students the Library needs to consider differing approaches to supporting and teaching students whose first language may not be English.
- Libraries should continue to collaborate with Faculty to design and delivery programmes that are embedded into course curricula so that students acquire the learning skills essential for quality learning.
- There will be increasing trend for academic staff to utilize Web 2.0 technologies in their teaching. The Library has an opportunity to develop a key role in informing and up-skilling academic staff in this technology.
- The Library needs to have an iterative approach to implementing technology in teaching which takes into consideration issues relating to pedagogy, sustainability, ease of use, ease of implementation and maintenance.

### REFERENCE SERVICES

- Innovative ways of taking reference services into reader spaces need to be considered to meet reader demands.

### RESEARCH

- The Library has a key role to play in the development of the institutional repository in support of the RQF. It will also have additional roles in areas such as citation analysis, copyright, and access.
- Collaborative research by teams working in various international locations will challenge the Library to develop federated authentication solutions to ensure timely access to resources.
- An opportunity exists for the Library to be involved in developing services for the storage, discovery and retrieval of raw research data.
- The Library needs to consider the types of partnerships it needs to build and the type and level of advocacy it has to do in order to support open access publishing.

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## RESOURCE DISCOVERY

- In the face of an increasingly diverse and fractured information landscape, the Library needs to develop tools which make it easier to discover and locate high quality information resources in a simple and convenient way.

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## DEVELOPING THE RIGHT SPACES

- In order to facilitate the diverse needs of readers in relation to the Library as a physical space a number of new strategies need to be considered, especially in regard to providing areas which allow learning “outside the classroom”.
- In designing collaborative spaces, technologies like projectors, wall mounted screens, team work software and equipment like the Microsoft Surface need to be considered.
- With the increase in ownership of mobile devices the Library needs to consider which services can be configured and delivered to take advantage of this technology.

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## DEVELOPING PEOPLE AND PROCESSES

- The Library must recruit, develop and retain talented staff who have exceptional skills in anticipating and responding to a quickly changing environment.
- The Library needs to review its operational planning process in order to respond more quickly to implementing changes relating to new technologies.
- The Library needs to enable timely evaluation, testing and implementation of new technologies by ensuring supporting infrastructure is flexible and has sufficient capacity for growth.

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## CAPITALISING ON ICT

- Funding IT to meet the increased number and expectations of students will be a key issue.
- A new mix of IT expertise may be required should the library tend towards using and developing Open Source solutions.
- As SOA and Federated Identity Management take off, information stewardship takes on increasing importance in ensuring that privacy and security concerns are considered and addressed at all levels.
- Privacy protection is a significant community theme and will continue to affect libraries.
- While local ‘green office’ initiatives are growing, libraries and/or their parent universities can expect to be drawn into cooperation with organisations such as ‘Australasian Campuses Towards Sustainability’.

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## BRINGING ORDER TO INFORMATION RESOURCES

- With the Library's collection expanding to cover new types of contents such as digital repositories, Librarians will need to be proficient in new metadata schema.
- The Library needs to determine to what extent it will join digital preservation and back-up initiatives and how the associated costs for them will be factored into the Library's budgeting plan.
- The Library should carry out some modelling of the impacts of exchange rate fluctuations on the Library's Big Deals and develop contingency plans if necessary.

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