

INFORMATION TECHNOLOGY



Strategic Plan 2010-2013

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Introduction

This is the National Library of Australia's medium term IT Strategic Plan covering the period December 2010 to December 2013. The IT Division's vision, mission and planning processes are aligned to support the Library's *Directions 2009-2011*. This Plan and the objectives and goals identified should be considered alongside the activities outlined in the IT Operational Plan 2010-2011 and the IT Asset Plan 2010-2015. The IT Strategic Plan will be revised annually to reflect changes in the strategic environment and current priorities.

Strategic Context

The Library's *Directions 2009-2011* identify a number of strategic objectives that are underpinned by information technology. Objectives with major IT implications include:

- Meet our user's needs for rapid and easy access to our collections and information resources;
- Increase the scale of digitisation of published Australian materials;
- Strengthen our technical infrastructure so that we can significantly expand the collection and preservation of born-digital content;
- Improve the processes associated with selecting and acquiring original materials through better workflows and automation; and
- Introduce a new online service (subsequently named Trove) incorporating all the information available through our existing discovery services.

The Library faces a critical challenge in undertaking its collecting and preservation roles in the digital age. A business case to provide the infrastructure and resources needed to support digital collection and digitisation, developed jointly with the National Archives of Australia and the National Film & Sound Archive has not resulted in any additional funding at this stage. In the absence of a funded program to address the full range of these requirements, the Library faces critical and immediate issues with IT systems that support these activities:

- The software and technical systems which the Library uses to collect, store and manage digital content are approaching the end of their useful lives and are becoming inefficient and difficult to maintain;
- If more robust tools are not acquired or developed, the Library will not be able to meet its collecting and access obligations into the future;
- The software and systems used by the Library to support its digitisation workflows and to deliver digitised collection items online are also increasing failing to meet our evolving needs; and

- An even greater challenge is the need to develop robust software tools to support the active management and preservation of our large and rapidly growing digital collection.

The Library will continue work with state libraries to explore the likely requirements for and opportunities to develop national infrastructure to efficiently support the collecting and service roles of the Australian library sector in the digital environment.

The Library will face increasing government and public expectations that it will continue to open up its collections for reuse by others. The challenges faced by the Library in this area include providing access through continued and increased digitisation, improving the ability of users to obtain copies of collection material, making its descriptive metadata useful through the addition of geospatial information, and providing rights information regarding the use of items in its collection.

During the period of this plan the Library will need to consider the future of its Integrated Library Management System and develop a replacement strategy for this core Library system.

Trends and technologies that are important to the Library and the potential threats, opportunities, or changes for the Library implied by those trends and technologies over the next three years include:

- The take up of a range of web-based services and technologies (e.g. blogs, wikis, and flickr) that support the management and distribution of information by individuals and communities; and the challenges and opportunities these present to the Library in terms of collecting material from these systems, as well as the use of such technology and social networks to facilitate knowledge creation and the use of its collections.
- The maturing eBook marketplace and the challenges this poses for the Library regarding the collecting and preservation of eBooks and other digital publications.
- The emergence of Web 2.0 services that explore the notions of:
 - the Web and all its connected devices as one global platform of reusable services and data;
 - data consumption and remixing from all sources, particularly user- generated content;
 - continuous and seamless update of software and data, often very rapidly;
 - rich and interactive user interfaces; and
 - an architecture of participation that encourages user contribution.
- The availability of mature virtualisation technology that enable better utilisation of IT servers to reduce energy consumption, and the cost effective deployment of services in high availability and/or highly scalable manner. The related emergence of public “cloud” infrastructure and services may influence the development of the Library’s IT infrastructure.

Key Objectives for 2010-2013

This plan outlines five strategic areas of activity for the IT Division:

1. Digital Library Infrastructure

Implement a next generation Digital Library Infrastructure to support rich, petabyte level, digital Australian collections, well managed, preservable and accessible for the long term.

This activity represents the IT Division's highest priority.

The Library will be unable to meet its full range of Digital Library requirements without additional funding. The Library proposes to address its essential minimum Digital Library requirements by re-directing internal resources including IT resources to undertake the Digital Library Infrastructure Replacement (DLIR) Project. This project has been scoped as a four-year project commencing in early 2011 and running over five financial years. While meeting the essential minimum requirements will enable the Library to continue to collect, manage, preserve and deliver its digital collections, the DLIR project will not address:

- The need for increased staff to collect "born digital" collection material;
- The provision of digital storage capacity beyond "business as usual" digital collection growth;
- The need for increased staff to undertake research in digital preservation techniques and collaborate with other agencies in the development of these techniques;
- The establishment of facilities and arrangements for improved off-site digital collection backup and disaster recovery;
- Continuation of a Library funded newspaper digitisation program beyond 2011 at the 2010 volume of digitisation; or
- Any increase in other digitisation programs, including the Library's aspiration to scale up its digitisation of out-of-copyright Australian print publications.

2. Discovery and Access

Provide systems to support the needs of our users for rapid and easy access to our collections and other information resources.

Trove is the key Library service supporting Discovery and Access in 2010-2013. During this period Trove will be:

- enhanced to support discovery of and access to full text journal articles;
- used to replace a number of existing discovery services;
- used to support the goals of the NSLA Reimagining Libraries Project 2 (Open Borders), Project 4 (Delivery) and Project 8 (Description and Cataloguing) ;
- enabled for external reuse and repurposing of content through the implementation of set of open APIs.
- the Library's premier platform for the use of Web 2.0 technologies to engage our users;
- expanded in coverage through collaboration with other collecting institutions, and
- used to support a pilot program enabling interlibrary loan requesting by end users.

The Library's public catalogue will be enhanced to support the functions of the eResources service and the eResources platform will be decommissioned.

3. Collection Management and Workflow Improvement

Support improvements in staff and user workflow efficiency through the implementation of IT-based services.

In the short term, a number of IT-based services identified as part of the GetWise project will be completed to improve staff workflow efficiency. The major area of activity will be the redevelopment of the Copies Direct service to improve the ability of Library users to obtain copies of collection material and to improve the efficiency of staff workflows used to provide these copies. The Library will also implement improved tracking for collection items, and further enhance the capabilities of Archivist Toolkit to support our requirements for special collection acquisition and management. No further major workflow improvement initiatives are planned for the period of this Plan due to resource constraints in the Library.

Some efficiencies and workflow improvements associated with the acquisition, management, preservation and delivery of the Library's digital collections will be achieved as part of the Digital Library Infrastructure Replacement Project.

4. Libraries Australia and Resource Sharing

Support and enhance Libraries Australia services.

The support and enhancement of our flagship Libraries Australia service will be an important IT objective through the life of this Plan. The major IT goal for this service is the migration of the Libraries Australia Search service to the single business discovery platform developed for Trove.

5. IT infrastructure and services

Provide best practice IT infrastructure and services to support the operation of the Library.

During the period of this plan, a number of major IT infrastructure and service projects will be completed. These include a whole of Library desktop refresh, the replacement of the Library's telephone system, the extension of wireless networking throughout the main Library building, and the implementation of a Web Content Management System for the Library's website. The Library will also improve the energy management and reduce the environmental impact of its IT services.

IT Division Purpose Statement

In partnership with our Library colleagues we provide quality technology solutions and ideas so that the Library as a whole can deliver on its strategic objectives with a high level of effectiveness, efficiency and probity.

By 2013, the IT Division will have:

- Made substantial progress replacing the Library's aging digital library systems with a digital library infrastructure that supports rich, petabyte level, digital Australian collections, well managed and preservable for the long term;
- Expanded the coverage and enhanced features of the Trove discovery service; providing rapid and easy access to our collections and other information resources including full-text content.
- In partnership with all areas of the Library, enabled the institution and its staff to fully engage and benefit from the World Wide Web as a global platform of reusable services and data.

Objective 1: Digital Library Infrastructure

Implement a next generation Digital Library Infrastructure to support rich, petabyte level, digital Australian collections, well managed, preservable and accessible for the long term.

The Digital Library Infrastructure Replacement (DLIR) project will be structured to deliver operational production services in a staged manner to maximise staff and user workflow improvements while minimising risk to the Library's digital collections.

Goal	Activities	Timeframe
Plan for the next generation of Digital Library Infrastructure.	<ul style="list-style-type: none"> Evaluate repository software that suitable to underpin the DLIR Plan and design the implementation of the DLIR, in collaboration with Digital Preservation and other business areas. 	2010 -11 2011-12
Replace existing core Digital Library Infrastructure, including: <ul style="list-style-type: none"> Digital Object Storage System (DOSS) Persistent Identifier resolver Digital Collections Manager (DCM) delivery systems Newspapers Collection Manager (NCM) PANDORA Digital Archiving System (Pandas) Prometheus Digital Preservation Workbench 	<ul style="list-style-type: none"> Implement a scalable storage system allowing archive masters to be stored online. Implement a scalable digital object repository supporting recording of preservation metadata Implement preservation planning and action capability Implement digitisation management, ingest and access services for the digitisation of physical collection items Implement management, ingest and access services for Web collecting Implement management, ingest and access services for physical format digital collection items Implement management, online deposit and access services for born-digital objects 	2010-11 2011-15 2012-15 2011-12 2012-13 2013-14 2013-14
Support and enhance existing digital library systems during DLIR project	<ul style="list-style-type: none"> Provide basic support for digital texts Enable acknowledgement of support/ sponsor of digitisation in online delivery systems 	2010-11 2010-11

Objective 2 - Discovery and Access

Provide systems to support the needs of our users for rapid and easy access to our collections and other information resources.

Trove is the Library's flagship service for discovering content within Australian collections and offers a single search across over 110 million items, including books, video and sound files, images, manuscripts, original research and newspaper articles. The Library will continue to develop the Trove service through functional improvements and increased coverage of Australian content to achieve our object for rapid and easy access.

Goal	Activities	Timeframe
Reduce the number of discovery services and associated platforms operated by the Library.	Migrate legacy search services to Trove, and decommission their dedicated service platforms. The Library will migrate: <ul style="list-style-type: none"> • Australian Research Online (ARO) • Music Australia • Australia Dancing • Picture Australia 	2011 2011 2011 2011
Enhance national discovery services.	Use Trove as a single business platform to develop: <ul style="list-style-type: none"> • An article-level discovery and access service to journal articles available through the online subscriptions of Australian collecting institutions • A set of APIs to enable organisations and individuals to develop new services through reusing, repurposing, and mashing-up services and content exposed through Trove. • Mobile-based discovery and access services • A full text search and discovery service providing (selective) public access to the Library's Australian whole-of-domain web archive Undertake routine maintenance and interface refinement	2010-11 2010-11 2011-13 2013 2010-13
Retire legacy search and indexing software (TeraText and BAT).	<ul style="list-style-type: none"> • As appropriate, redevelop systems using these legacy software products into the Trove platform 	2012
Improve access to Library collections through our catalogue.	<ul style="list-style-type: none"> • Maintain and improve the current VuFind catalogue interface through regular • Replace eResources service through enhancement of the VuFind library catalogue interface 	2010-2013 2011

Objective 3: Collection Management and Workflow Improvement

Support improvements in staff and user workflow efficiency through the implementation of IT-based services.

Due to resource constraints, the Library has not scheduled any major workflow efficiency projects beyond those already underway at the time this plan was drafted. The replacement systems developed by Digital Library Infrastructure Replacement Project will deliver a number of workflow efficiencies for staff engaged in the acquisition, management, preservation and delivery of digital collections.

Goal	Activities	Timeframe
Improve workflow efficiency in the areas of collection management and description, and service delivery to the public	Analyse requirements, develop and improve systems as appropriate for the following: <ul style="list-style-type: none"> • Archivists' Toolkit • NLA Tracker • Exhibitions Management • Reproduction Services • Reimagining Libraries - Distributed reference enquiries using RefTracker • Acquisition of special materials 	2010-11 2011 2010 2009-11 2011 2011
Maximise the capability and usability of the ILMS	<ul style="list-style-type: none"> • Identify and implement workflow improvements through the ILMS • Improve public access to Library collections through enhancement of VuFind online catalogue • Identify options for the replacement of the ILMS 	Ongoing

Objective 4: Libraries Australia & Resource Sharing

Support and enhance Libraries Australia services.

The objective is to provide IT resources to support and enhance Libraries Australia Services as identified by the Resource Sharing and Innovation Division Strategic Plan 2010-2012.

Goal	Activities	Timeframe
Enhance Libraries Australia Services	<ul style="list-style-type: none"> Improve the performance and stability of Libraries Australia Search through the redevelopment of Libraries Australia Search module using the single business discovery platform developed for Trove. 	2010-13
	<ul style="list-style-type: none"> Explore with selected libraries the feasibility of enabling their local discovery services, including their local catalogues, to become "views" of Trove. 	2011-12
	<ul style="list-style-type: none"> Undertake regular enhancement and upgrades to the software supporting Libraries Australia services 	2010-13
	<ul style="list-style-type: none"> Explore the feasibility of migrating both the Australian Libraries Gateway and ILRS Directory into the WorldCat Library Registry. 	2011-12

Objective 5: IT infrastructure and services

Provide best practice IT infrastructure and services to support the operation of the Library.

To deliver a high quality, flexible and responsive IT infrastructure through ensuring that agreed obligations with our business partners can be met.

Goal	Activities	When
Ensure an annual availability of all IT services of at least 99.5%	<ul style="list-style-type: none"> Calculate availability monthly and report figures to business owners and through the Balanced Scorecard. Develop an overall Library Service Level Agreement (SLA) document that encompasses the Key IT services 	Ongoing 2011
Improve overall reliability of core IT applications and systems by increasing the meantime between failures.	<ul style="list-style-type: none"> Automate SLA reporting and the identification of weak or failing components by continuous improvement in the Library's network management system and processes. Implement a higher level of redundancy in services through increased server virtualisation and provision services through Private Cloud computing technology. Ensure all assets are refreshed / replaced through ongoing asset replacement programs identified through the Asset Management Committee. This will reduce the likelihood of component failures. 	2011 Ongoing Ongoing
Maintain serviceability of Operating Systems and applications.	<ul style="list-style-type: none"> Ensure that equipment remains functional and durable by delivering patches and service packs in a timely manner Ensure best practice change control processes are followed 	Ongoing Ongoing
Ensure availability of core systems by developing a basic off-site 'warm' Disaster Recovery facility	<ul style="list-style-type: none"> Implement disaster recovery capability using an dedicated fibre optic cable from the Library's Internet Service Provider (ISP) to an off-site data centre, providing 	2011
Maintain and enhance the serviceability of the telephone system, replace the current voice platform with Voice Over IP (VoIP) technology.	<ul style="list-style-type: none"> Select and procure an appropriate VoIP PABX system, decommission existing Ericson MD110 PABX Integrate relevant applications into the VoIP PABX 	2010-11 2012
Maintain desktop infrastructure	<ul style="list-style-type: none"> Replace desktop PCs and laptops based on a review desktop requirements and numbers (noting government targets for desktop devices per end user). Replace multi-function devices and printers based on a review of usage and requirements (noting government targets for desktop to printer ratio). 	2010-11 2013-14
Provide comprehensive Wi-Fi access throughout main Library building	<ul style="list-style-type: none"> Install additional Wi-Fi access points Enable secure staff access using authentication 	2011-12 2011

Reduce energy use and environmental impact of IT through the Whole of Government Green IT program	<ul style="list-style-type: none"> Undertake staff training on the Whole of Government Green IT program In collaboration with Government, develop Key Performance Indicators to ensure better Green IT practices are implemented and maintained All IT purchases are managed with environmental impacts assessed as part of the procurement process Reduce data centre energy consumption through server virtualisation 	Ongoing 2010-11 Ongoing Ongoing
Improve the management of content at NLA Web	<ul style="list-style-type: none"> Implement a Content Management System (CMS) for NLA Web and migrate the current (static) pages on the website into the new CMS. The stages of implementation are: requirements gathering and analysis; design; development and testing; deployment and maintenance. Analyse and review Library wide requirements for statistical reporting. Work with the NLA Web Governance working group to manage content ownership of NLA Web. 	2010-11 Ongoing
Strengthen digital culture across the Library	<ul style="list-style-type: none"> Extend IT awareness through seminars, digital culture talks and develop a sandpit ethos for sharing ideas and prototyping. Undertake collaborative development projects with other divisions as they investigate technologies for new online services, video production, etc. 	Ongoing Ongoing
Meet government expectations for use of Web 2.0	<ul style="list-style-type: none"> Evaluate existing initiatives incl blogs, forums, Twitter, Facebook Develop a social networking policy Implement creative commons licencing Investigate new initiatives 	2010-11 2010 2010-11 2011-13
Champion best practice for web design and technology	<ul style="list-style-type: none"> Refine the design, implement and document the various content type templates used on NLA Web. 	Ongoing
Support web authors to publish content on NLA Web	<ul style="list-style-type: none"> Analyse, review and improve the overview of our collections published at NLA Web as part of the Collection Information at NLA Web (CINW) project, publishing the new content when available. 	Ongoing

Resourcing

The cost of IT resources¹ to support this plan over three years² is \$27.9 million, comprising operating expenses of \$16.4 million and capital expenses of \$11.5 million.

A breakdown of costs is as follows:

		2010-11	2011-12	2012-13	3yr Total
		\$Million	\$Million	\$Million	\$Million
Base Funding					
	Operating	\$5.05	\$5.16	\$5.21	\$15.42
	Capital	\$3.23	\$2.03	\$2.59	\$7.85
Project Funding					
DLIR	Operating	\$0.00	\$0.28	\$0.52	\$0.80
	Capital	\$1.10	\$1.51	\$0.48	\$3.09
LA Search	Operating	\$0.00	\$0.07	\$0.07	\$0.14
	Capital	\$0.00	\$0.28	\$0.28	\$0.56
Total Funding					
	Operating	\$5.05	\$5.51	\$5.80	\$16.36
	Capital	\$4.33	\$3.82	\$3.35	\$11.50
	Total	\$9.38	\$9.33	\$9.15	\$27.86

¹ These costs generally do not include the staff costs incurred by divisions other than IT in supporting the activities identified in this Plan.

² Although the Plan covers the period December 2010 to December 2013, these costs reflect the financial year costs July 2010 to June 2013.

Appendix 1: Information Technology Division and Infrastructure

The primary responsibility for supporting the Library's information technology services rests with the Information Technology Division. This Division consists of approximately 43 positions, organised into four branches, as follows:

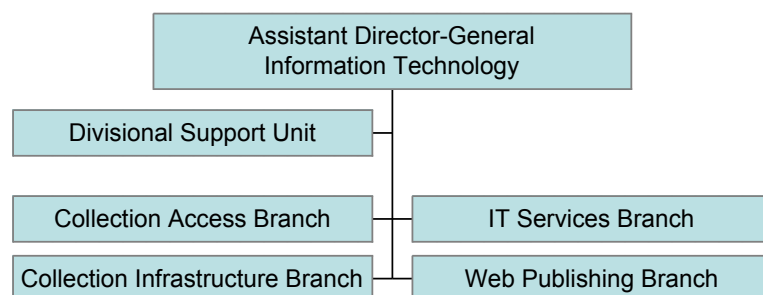
Collection Access Branch: provides development, implementation and maintenance support Libraries Australia and Trove.

Collection Infrastructure Branch: provides development, implementation and maintenance support for IT Systems that underpin the work of Library staff in building, managing and preserving its collections, both physical and digital.

IT Services Branch: in partnership with business areas within the Library provides for client support and the operational support for a range of IT-based Library services, including network services and the IT Help Desk.

Web Publishing Branch: provides the framework for publishing web content and supports business areas in contributing high quality content to NLA Web and OurWeb.

Information Technology Division
Organisation Chart



The Library's information technology infrastructure consists of:

- 46 dedicated application and infrastructure servers, and 4 virtualised servers supporting an additional 30 application and infrastructure virtual servers. Servers use a use a range of operating systems (Solaris, Linux and Windows 2003);
- 140TB of online storage and 500TB of near-line tape storage;
- 800 desktop PCs (mostly Dell Pentium 4 machines, running Windows XP), 30 Macintosh desktop computers and 74 printers;
- a number of Ethernet local area networks, supporting the needs of staff, the public, Internet security;
- a wireless network for Library users in the reading rooms and public areas;
- a wide area network consisting of a 100Mbs link to the Internet; and a link between the main Library building and the Annex in Hume; and
- an Ericsson PABX, with about 540 connections, and a small VoIP system.

Appendix 2: Implementation, support and life cycle management

Software

New and replacement software is sourced on the basis of fit for purpose and value for money. Preference is given to the use of commercial off-the-shelf software and open source collaborative software over in-house development.

In non-core business areas such as corporate systems (e.g. finance, HR and records management) and desktop productivity applications (mail, word processing etc) where mature functional software is available in the commercial marketplace, the Library purchases commercial solutions and engages in only minor, if any, customisation. This customisation is usually in the form of vendor supported configuration localisation during implementation. The Library uses business area and IT resources to provide first level support with vendor-based maintenance contract arrangements for other support.

In the area of core library systems, the Library adopts a modular approach selecting software (Commercial/Open source) that best meets its requirements, then enhancing the software as required to meet the Library's functional requirements and to integrate with other Library systems. These enhancements are carried out using a mixture of in-house development resources, vendor support and third party developer resources.

The Library's experience with and assessment of the commercial library systems marketplace is that vendors are well placed to supply systems to support traditional mainstream library functions associated with collection acquisition, bibliographic control, circulation, document supply and interlibrary loan. In all these areas the Library has largely and successfully based its services around commercial systems. As is the case for non-core business systems based on commercial products, the Library uses business area and IT resources to provide first level support for commercial library systems with vendor-based maintenance contract arrangements for other support.

The Library expects, during the period of this plan, to continue to invest in the implementation and enhancement of open source systems to meet its requirement for digital library systems. The Library will continue select an implementation approach for individual new services on the basis of market testing commercial products and open source software. Current experience suggests that the marketplace for commercial digital library systems, while improving in its capability to meet the Library's requirements, is characterised by immature, expensive products that are unable to significantly meet the Library's functional and performance requirements. Examples of such systems include collection, management and preservation of digital collection material, management and description of original material collections, and online discovery services. For open source based, in-house systems, the Library allocates development and support resources on an 70:30 split, i.e. 70% of development resources are allocated to support innovation while 30% of resources are allocated to support of existing systems.

The Library is committed to use of open standards. In particular, the Library seeks to use standards to ensure cost-effective interoperability both between its internal systems, as well as between these systems and external collection management, discovery and information access systems. The Library also sees open standards as a key tool in allowing it to cost-effectively manage the life cycle of software systems, support transition to new systems as required and enabling innovation in the services offered by the Library and the use of Library collections and metadata resources.

The Library uses a build as open source software by default model for internal system development. All code developed by the Library or via an external contractor is publically accessible on a web-based code repository to be used and extended under standard open source licence arrangements unless the requirements of a particular project prevent open sharing of code. Internal code development is generally Java-based using a standards-based application framework.

Hardware

The Library overwhelmingly uses commodity hardware sourced via competitive tender on the open market. Industry standard life cycle management is used. Hardware support is vendor provided based on a mixture of warranty and support contract arrangements.

Appendix 3: Environmental Impact

During the period of this plan the Library will continue to maintain, adopt and improve measures to manage the environmental impact of its IT activities. The Library will carry out activities outlined in this plan in accordance with the strategies and actions specified in the “Australian Government ICT Sustainability Plan 2010-2015”. In particular:

- the sustainable procurement guidelines will be used for IT procurement;
- old desktop computers and other suitable IT equipment will be donated to Computer Technologies for Schools project for reuse in schools;
- power management procedures and technology will be used to reduce energy use by IT equipment;
- server virtualisation will be used to reduce the number of and energy requirements of the Library’s computer server infrastructure;
- recycling and safe disposal processes will continue to be used for packaging and e-waste; and
- computer rack-based power monitoring will be progressively installed in the computer room to enable monitoring and analysis of power utilisation.

In spite of the measures outlined above, the Library expects that its overall IT-related energy consumption will increase during the period 2010-2013. This increase will be due primarily to growth in disk storage required to store and manage the Library’s growing digital collection.