



NDHA

NATIONAL DIGITAL HERITAGE ARCHIVE

Securing the Future: Digital Preservation at the National Library of New Zealand

International Group of Ex Libris Users (IGeLU)

Madrid 2008

Steve Knight,

Associate Director National Digital Library

National Library of New Zealand

Riding Instructions 1

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What I was asked to
talk about

- Digital preservation system development with Ex Libris
- Relationship with Digitool & development of the new system
- Usability issues & resource discovery issues (for users)
- Ingest and management issues for librarians
- Deposit and ingest issues for users
- Cataloguing and metadata issues for librarians
- Relationships between items in the NDHA and other repositories/systems at the National Library
- Workflow issues for staff involved in the NDHA and other library systems

What I'm going to talk about

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How I hope to touch
on these topics this
morning

- The digital environment
- NLNZ drivers
 - legislation, Legal deposit
- NLNZ, Ex Libris and DPS
- Organisational issues
 - Business change
 - Migration
 - Integration
 - Capability and capacity
 - Performance measurement
- A national strategy
- Digital preservation as the sine qua non

The 'digital environment'

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The digital native

Isn't it amazing what kids know?

- Democratization of information production and access
- Citizen's created content and will impact on our collecting and preservation processes.
- 'New Zealanders connected to information important to all aspects of their lives'.
- Paradigm shift in client expectations of how knowledge and information should be made available to them
- Relevance and viability of national libraries determined by their ability to respond to these changing expectations
- Digital preservation will become an increasingly important component of New Zealand's knowledge infrastructure.
- Digital preservation as part of an overall strategic and holistic approach to the surfacing of our collections.

The Problem Statement

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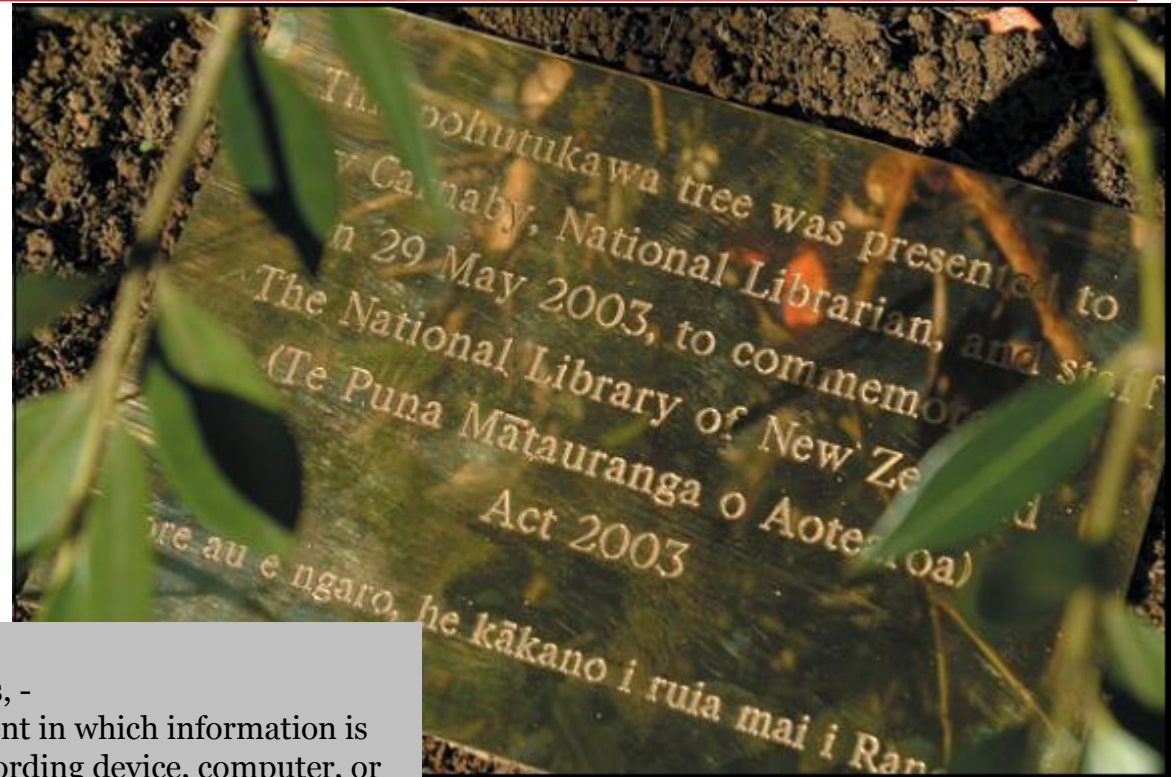
Garrett, J. &
Waters, D. (eds).
(1996).

*Preserving digital
information*

‘ the problem of preserving digital information for the future is not only, or even primarily, a problem of fine tuning a narrow set of technical variables. It is not a clearly defined problem ... rather, it is a grander problem of organizing ourselves over time and as a society to maneuver effectively in a digital landscape. It is a problem of building ... the various systematic supports ... that will enable us to tame the anxieties and move our cultural records naturally and confidently into the future.’

The National Library Act 2003

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Part 4, 29 (1)

In this part, unless the context otherwise requires, -

electronic Document, means a public document in which information is stored or displayed by means of an electronic recording device, computer, or other electronic medium, and includes an internet document

internet Document, means a public document that is published on the Internet, whether or not there is any restriction on access to the document; and includes the whole or part of a website

make a copy, in relation to an internet document, means to make a copy of the document for the purpose of storing and using it in accordance with this Part; and includes circumventing any technological protection measures that would otherwise prevent or hinder the copying, storage or use of the document

Electronic legal deposit

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Why the government wants two copies of your CD

Right of reply

National librarian Penny Carnaby responds to Owen McKeane's comments on the National Library's plans to archive all digital material

KEY POINTS

- Electronic documents collected by the National Library will be permanently housed in its digital archive
- Internet documents that avoid any loss of access through obsolescence of hardware and software. Although the library will migrate electronic documents published in other formats, it will not migrate them.

heedless manner. We are not going to ignore the concerns of the publishers. The library will establish access terms and conditions that ensure it protects the commercial interests of publishers and creators. We are aware and concerned about the problems of piracy.

The government's new policy – 'steal this record

The government declares itself in favour of the knowledge economy and is a serious promoter of New Zealand art and culture.

Yet, curiously the National Library seems determined to undermine these policies.

The National Library Act of 2003 requires all publishers in New Zealand to lodge three copies of their works with the library to build a collection of all local works. These are available to the public. So far so good. This is common practice overseas.

However, the library now proposes that the "documents" which must be lodged in their collection include electronic media such as audiotape, videotape, CDs, CD Roms and DVDs.

So if you are planning to

make a CD of one of New Zealand's choirs singing French medieval music, or a DVD of the history of Chinese families who settled in New Zealand you must lodge three copies with the library.

Even this may not seem unreasonable.

The problem is that the library will digitise this on the worldwide web for all and sundry to listen to, download and copy.

The National Library seems unconcerned by the risk of copying. It ingenuously points out that normal copyright protection is available to any author, composer or publisher whose material is unlawfully copied.

Please tell me, how can a specialist music club or historical society afford to take

legal action against some unknown person in France or Hong Kong who decides to download and copy a hundred CDs for sale to French or Chinese enthusiasts?

Why would anyone invest in a film in New Zealand if the film is to be digitised and posted on the web for all and sundry to download and copy? What will Creative New Zealand say when its successful productions are posted on the web for all to steal?

The library is suggesting a time limit of three years or more before posting such material on the web. This may be OK for the latest song by some New Zealand Idol. But what about work which has a longer life?

New Zealand has pro-

duced, and continues to produce, its fair share of world-class opera singers and musicians, who will simply make sure their records are produced in jurisdictions which don't aid and abet the theft of their intellectual property.

The assaults on private property on the foreshore and farms have been bad enough. But at least the government was stealing land from a few New Zealanders to hand over to other New Zealanders.

Why would any government want to steal the artistic works of New Zealanders to hand them over to foreigners?

I just hope I'm missing something here.

Our cyberspace publications will be available to future historians

THROWING OPEN THE DOORS

The National Library steps onto the path of the information de

BY RUSSELL BROWN

These are exciting times in which to be a librarian. And more so, as it happens, to be a librarian in New Zealand. The past decade and a half has seen an extraordinary

the provisions in the act is an extension of the legal requirements for deposit with the library. Legal deposit now encompasses digital publications, such as CDs and DVDs – three copies of which must be deposited with the library.

Carnaby a right the ne and ex stepp a hee

Environment for Change

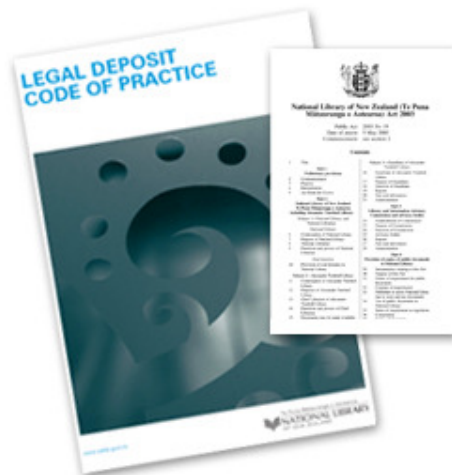
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Legislation



National Library of New Zealand (Te Puna
Mātauranga o Aotearoa) Act 2003

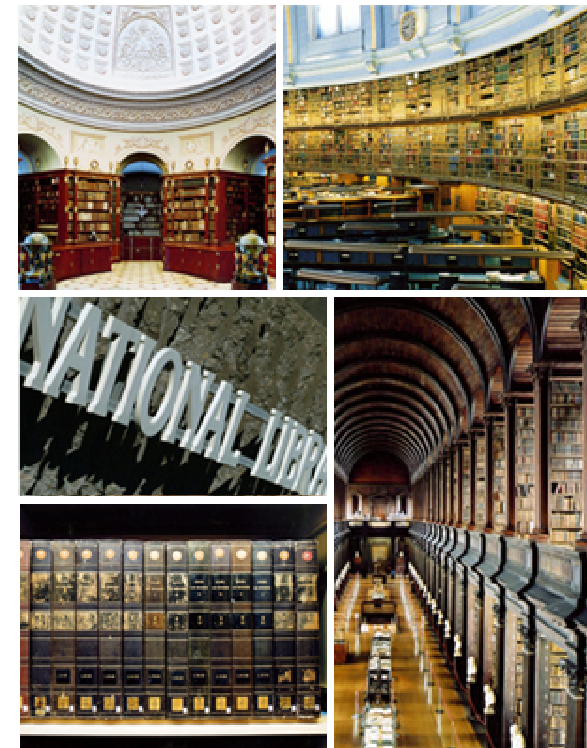
Public Act 2003 No 19
Date of assent 5 May 2003
Commencement see section 2



Strategic Vision



International Community

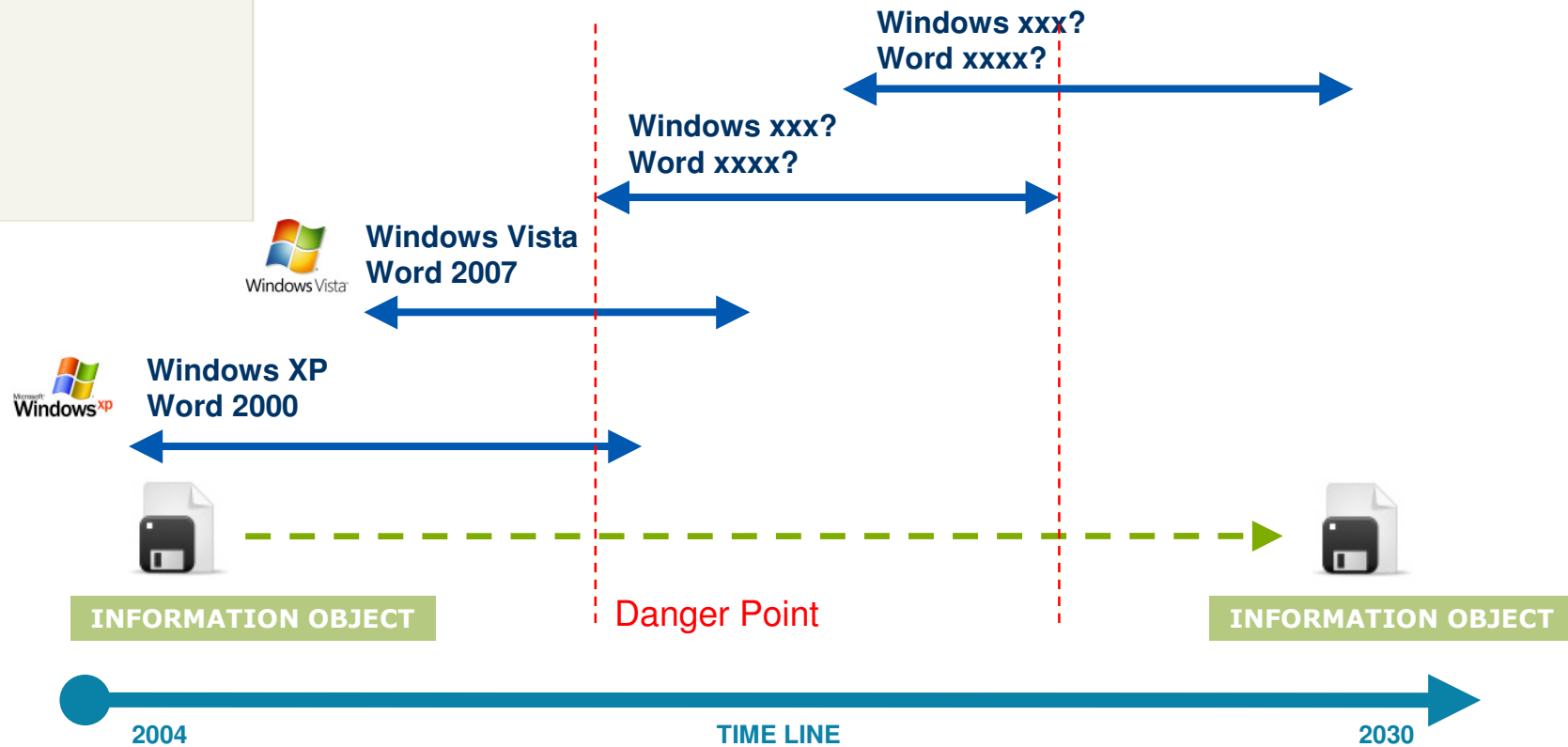


The Other Problem Statement

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Technology as the
enemy?

The evolution of technology environments



NDHA Programme

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Goal

Collection, preservation
and access in
perpetuity

To establish the National Digital Heritage Archive to enable the National Library of New Zealand to meet its **mandate** to **collect**, make **accessible**, and **preserve in perpetuity**, New Zealand's **digital heritage**, as defined by the Library's current collection policy

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Securing the Future

Partnership 1

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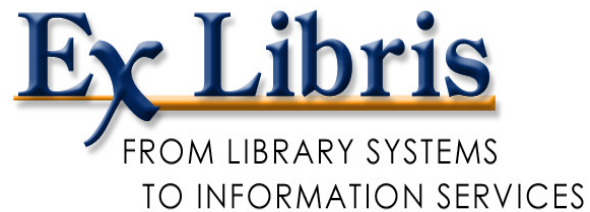
Partnership

We cannot do this
alone



Design & Build

Sun Centre
of Excellence



Partnership 2

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Some philosophical questions

Buy or build?

Proprietary or open
source?

Or are they religious
questions?

- Commercial solution vs. building it yourself vs. project based company
 - User community
 - Enhancements
 - Continuity
 - Open source 80% (Jhove, Droid)
- Important to look at the required institutional outcome
- Repository solutions, digital archiving solutions and digital preservation systems are unlikely to be the same thing

Partnership 3

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Not a National
Library of New
Zealand cul-de-sac

It is important from
NLNZ perspective
that the solution is
not NLNZ specific

- Digital Preservation System (DPS)
 - generic software solution for the wider market
 - broad ranging digital preservation solution for a range of community interests
- NDHA - the NLNZ implementation of DPS
 - wider functionality and business change are required for practical digital preservation within any given institution

Partnership 4

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Peer review Group

What to do when
the business
(NLNZ) and the
vendor (Ex Libris)
can't agree on an
issue



Cornell University
Library



University of Helsinki Libraries

Koninklijke Bibliotheek
Nationale bibliotheek van Nederland



Partnership 5

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Stakeholders

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Stakeholder

“anyone who is affected by – or - can influence, the decision or outcome”

NDHA Cross Government Group

- ACC
- Archives New Zealand
- Crown Law Office
- Customs NZ
- Department of Building & Housing
- Department of Child, Youth & Family Services
- Department of Internal Affairs
- Department of Labour
- Department of the Prime Minister & Cabinet
- Inland Revenue Department
- Land Information New Zealand
- Ministry for Culture & Heritage
- Ministry for the Environment
- Ministry of Agriculture & Forestry
- Ministry of Defence
- Ministry of Economic Development
- Ministry of Education
- Ministry of Justice
- Ministry of Research, Science & Technology
- Ministry of Social Development
- NZ on Air
- Parliamentary Library
- State Services Commission
- Statistics New Zealand
- Te Puni Kōkiri
- The Film Archive
- The Treasury

Gap Analysis

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Gap Analysis

What's the gap between what we want and what they've got?

- Analysis of the gap between the Library's functional requirements for digital preservation and the level of functionality available in the Ex Libris DigiTool product
- 9 categories of gaps
 - Deposit
 - Staging
 - Data model
 - Repository
 - Validation
 - Hardware
 - Permanent
 - Ingest
 - Preservation

72 Gaps

Gap 17: Data Model - Events

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Gap Analysis

Quite a bit as it turns out ;-)

- **G17** - Some of the events should be stored as provenance information
- At present, 83 separate events are required to be monitored within the system
- Information relating to some of these events is required to be kept permanently as part of the provenance data for an object going into the future

Gap 17: Data Model - Events

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Gap Analysis

Such as a range of
provenance events.

- Event 4 – System generates fixity information/values
- Event 17 – System deletes a viewing copy
- Event 20 – System performs a virus check on a
SIP/manifestation
- Event 22 – System updates the file fixity Metadata
- Event 24 – System validates the file format
- Event 38 – Create viewing copies of the files
- Event 42 – System creates a manifestation
- Event 50 – System deletes a manifestation from
archival storage
- Event 54 – System stores metadata in the repository
- Event 57 – System performs a fixity check on a
SIP/manifestation
- Event 79 – System runs preservation action on
manifestation

Out of scope gaps

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Out of scope

10 gaps were explicitly stated to be out of scope

Hardware

NG1 - support for backup

NG2 - support for disaster recovery

NG3 - support for disaster recovery (off-site backup)

NG4 - any component in the hardware configuration should be duplicated

Third party applications

NG5 - hardware support for external components

NG8 - support for the Library's internal systems

NG9 - support for conversion of current applications into the preservation system

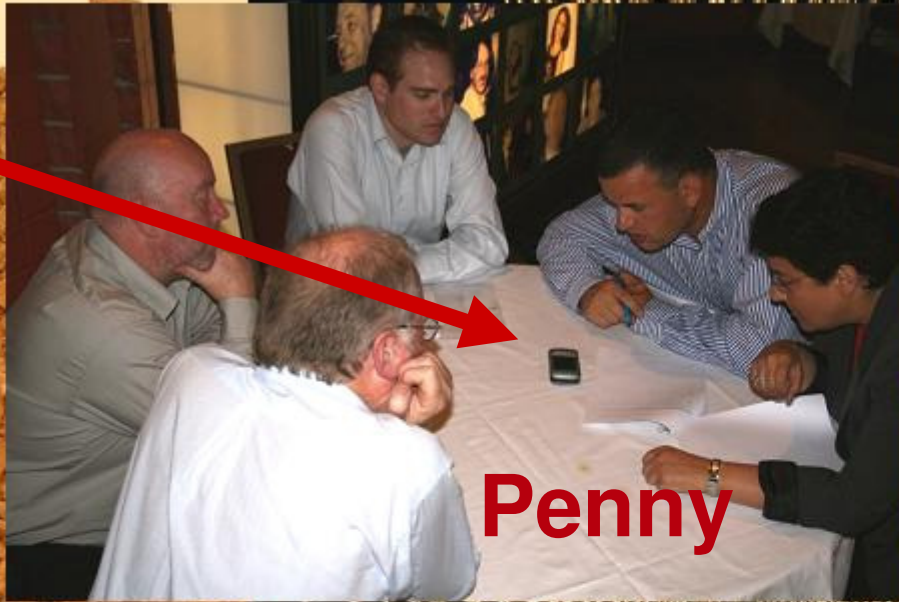
NG10 - support for internal access applications

Infrastructure

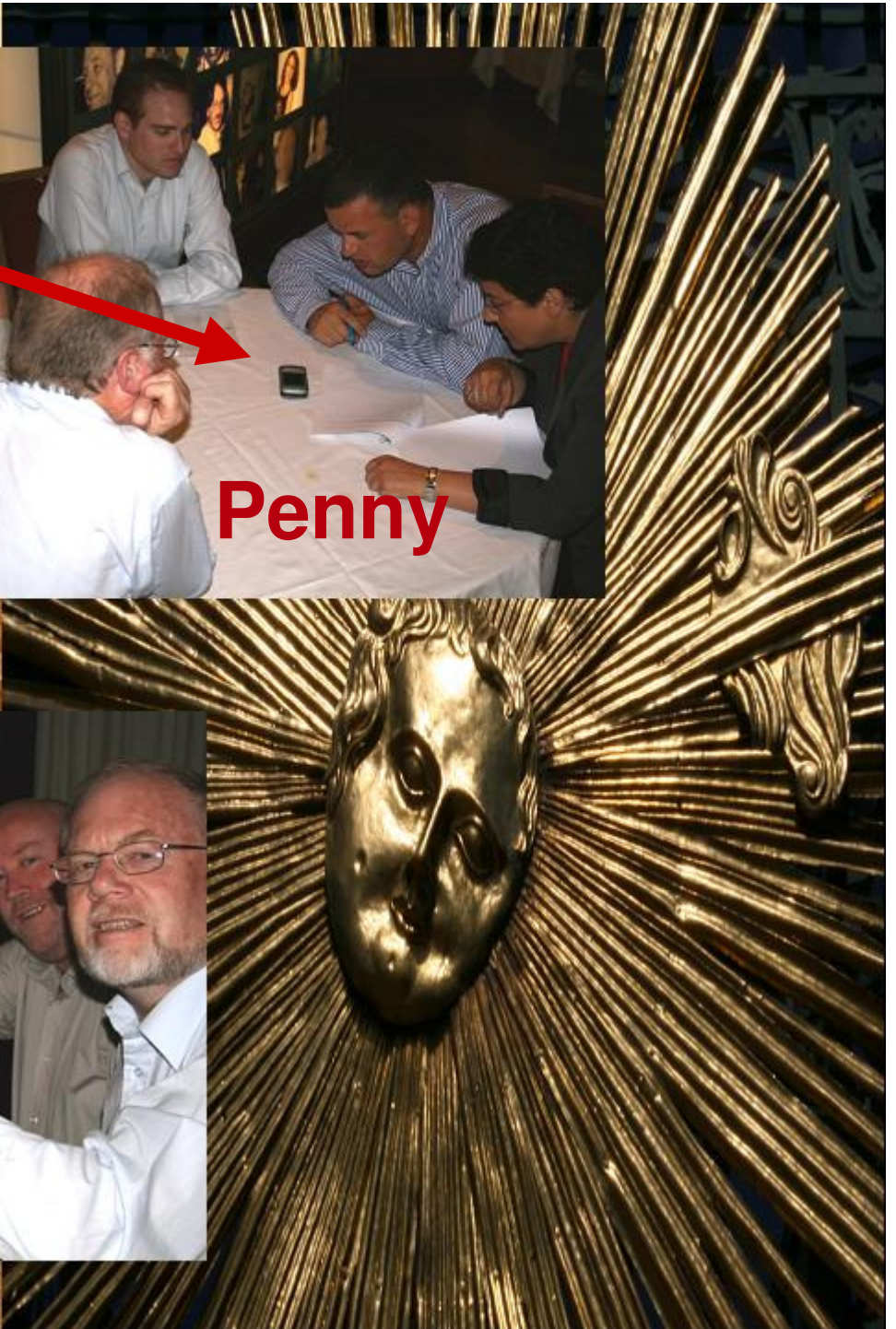
NG6 - ability to monitor the system

Repository

NG7 - support for generating reports on usage and other info

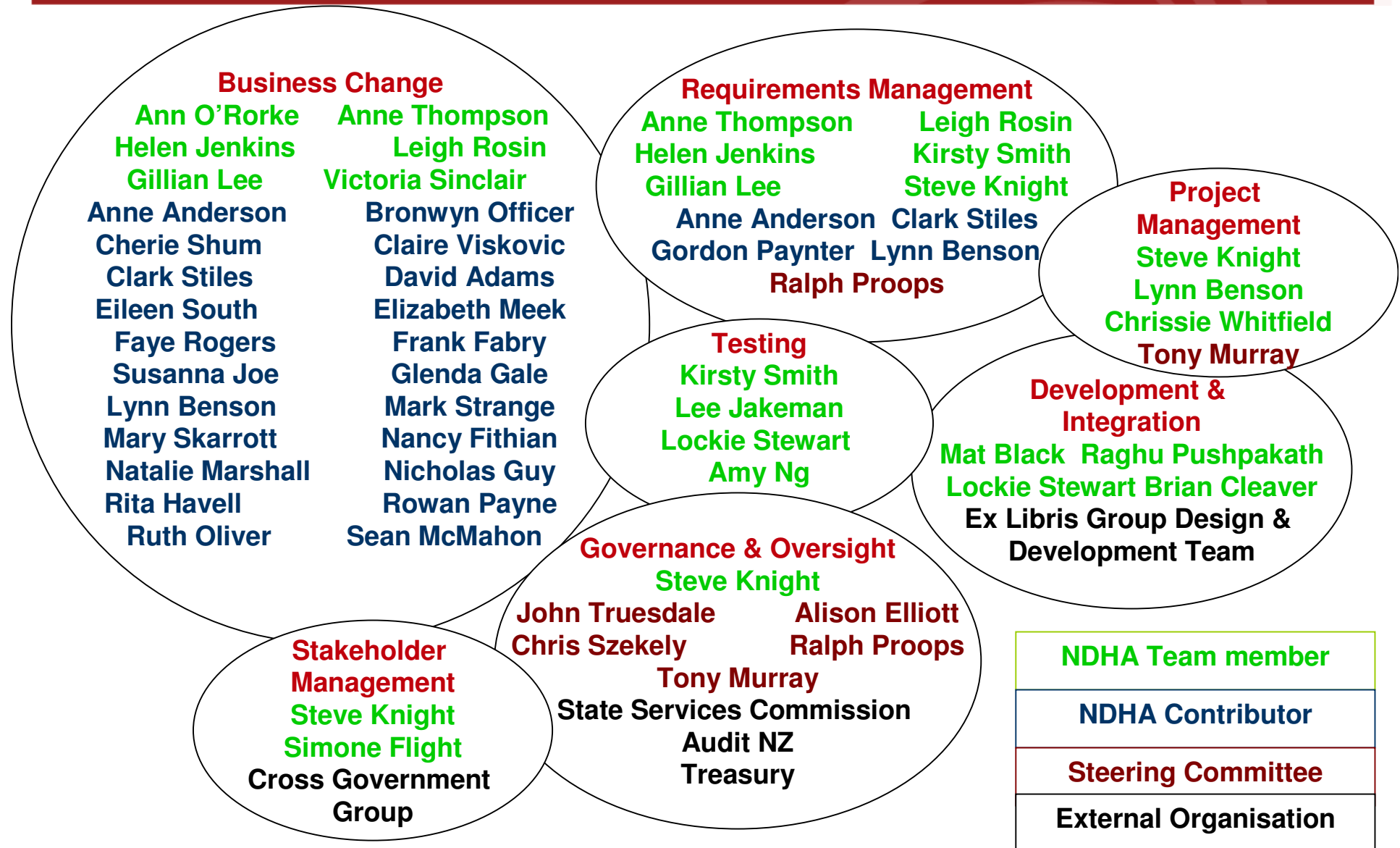


Penny



Team

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Phased Approach

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Phase 1 – Live Production System 75%



NDHA operational for INGEST STORAGE ACCESS

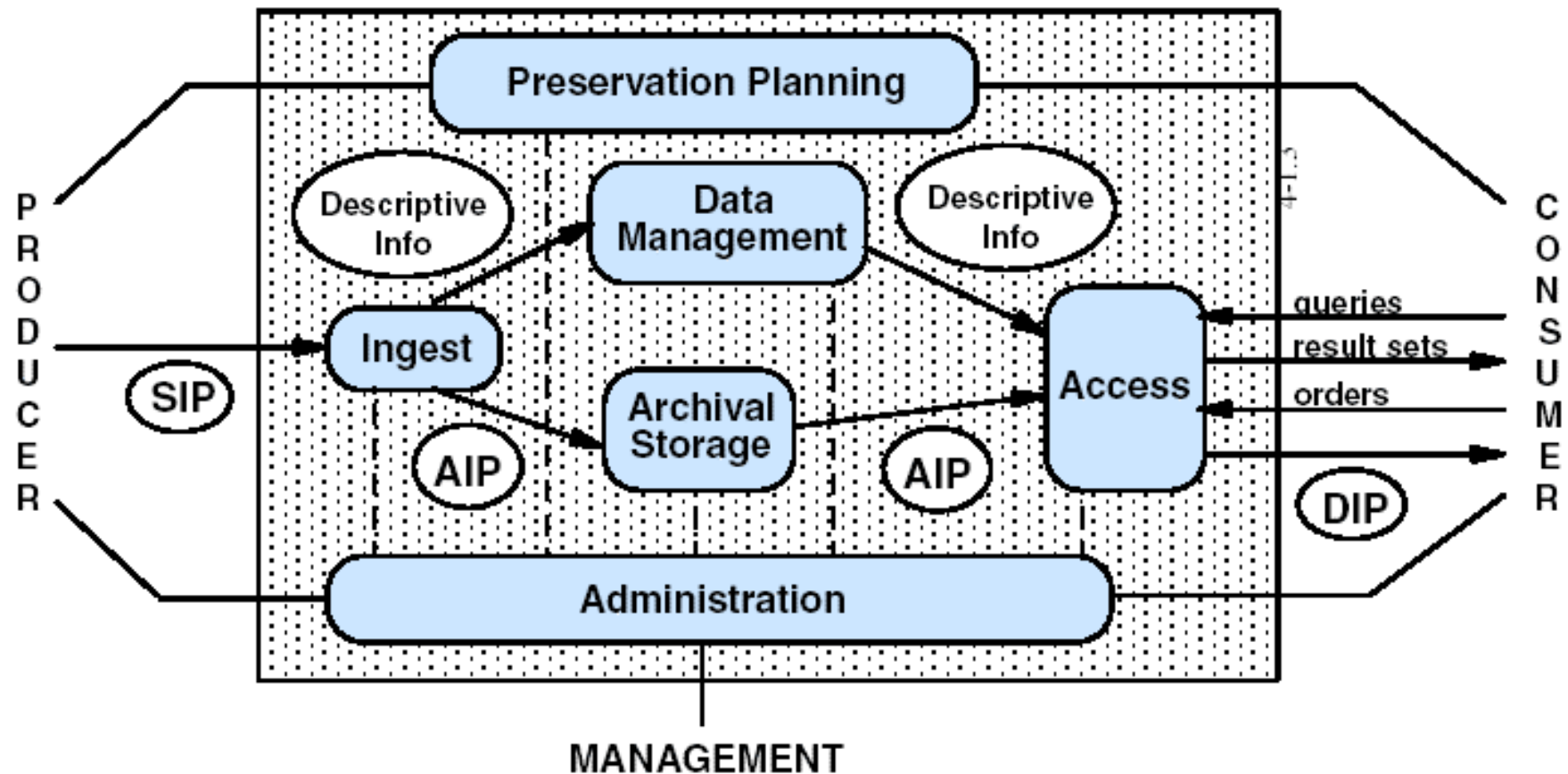
Phase 2 – Fully Operational 100%



NDHA operational for DIGITAL PRESERVATION
plus the balance of the functionality

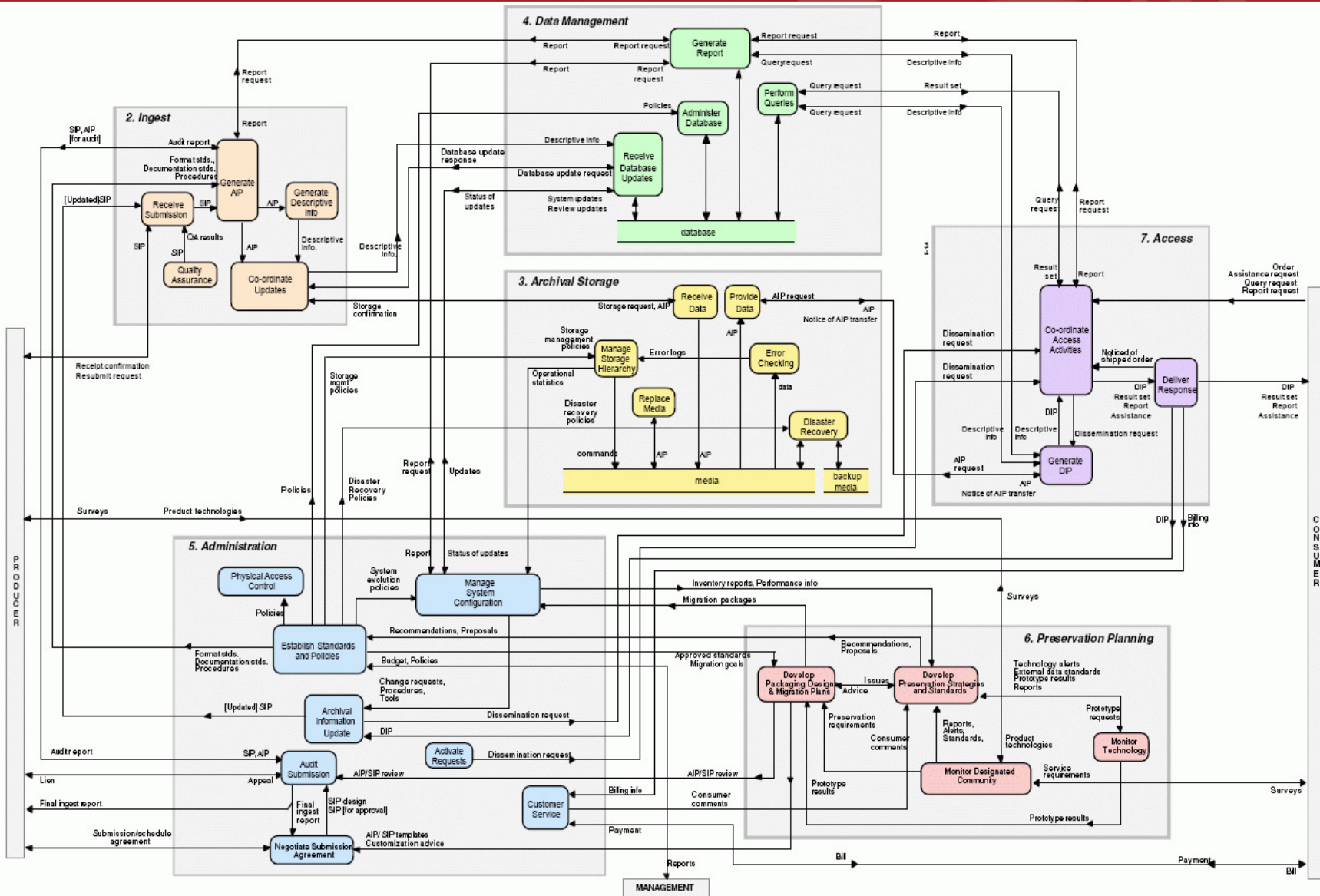
OAIS Reference Model

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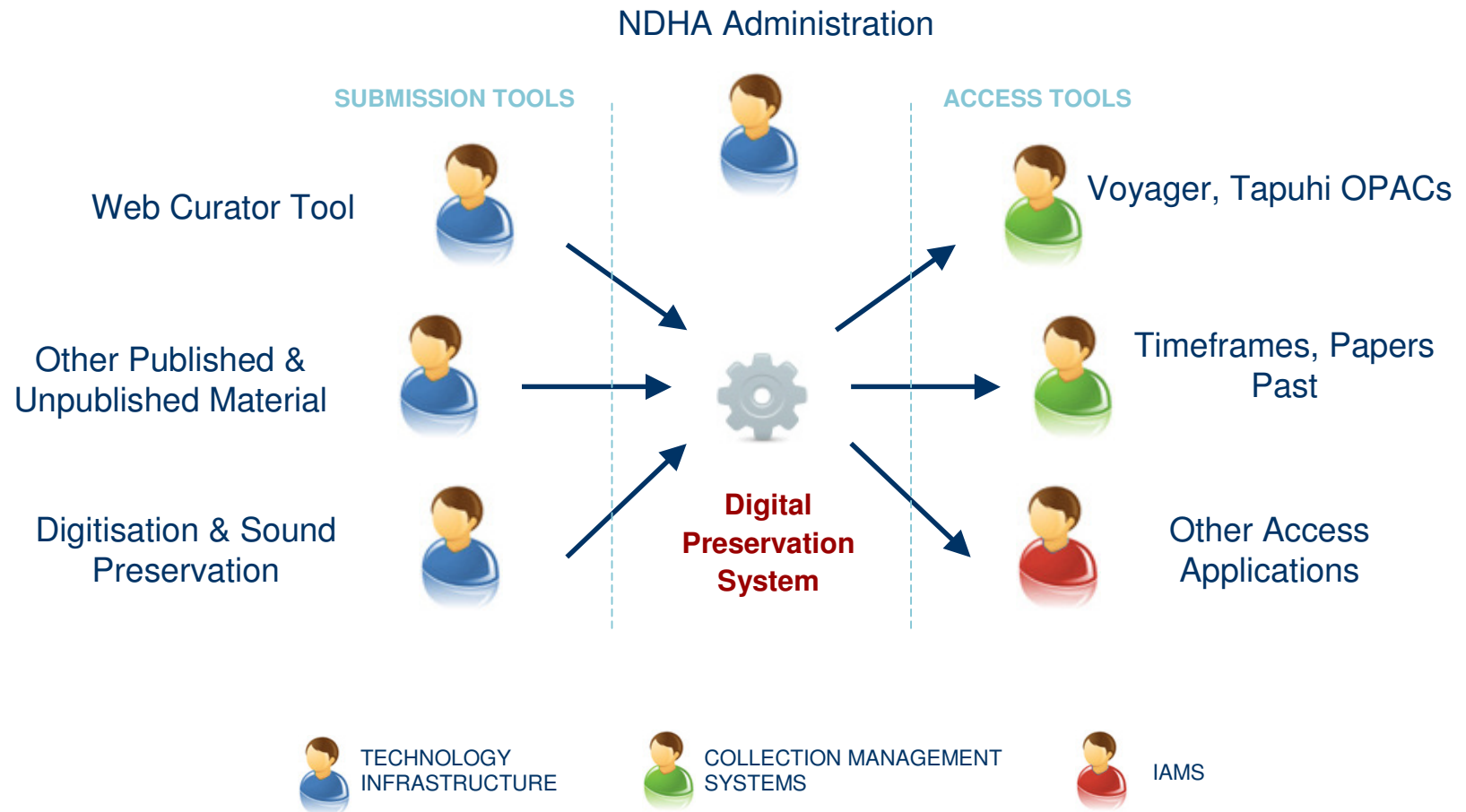
OAIS base map

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DPS & the NDHA

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Work Streams

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Business Change

Business Analysis - Process Mapping - Resource Mapping - Socialisation - User & System Documentation - Training

Requirements Management

FRS

Gap Analysis

Scope / Deliverables Management - Change Control

Systems Development

Specify - Code - Unit Test - System Test - Performance Test

DPS R1

Systems Integration

CMS - Resource Discovery - Deposit Applications

DPS R2

Acceptance Testing

Criteria - Planning - Scenario - Scripting - Test Data - Testing

July 2004

Dec 2006

June 2007

Sept 2007

Oct 2008

Oct 2009

DPS functionality at Day 1

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Phase 1 Specifications

From producer management →
workflow automation
→ delivery, audit trails & reporting

- User management
- Producer management
- Deposit 1
- Deposit 2
- Validation stack
- Intellectual Entity (IE) data model
- Submission Information Package (SIP) submission
- SIP processing
- Deposit registration
- Technical analyst
- Workbench
- Consolidated appraisal workbench
- DPS transformers
- Deposit Application Programme Interface (API)
- Audit & provenance
- Process management
- User management API
- Permanent repository
- Delivery
- Meditor
- Reports
- Back office configuration

Phase 2 delivery

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Phase 2 Specifications

Preservation planning and action are in Phase 2 to allow for extended requirements analysis prior to development

- Format Library
- Risk analysis
- Preservation action
- Enhanced set import/export management for preservation actions
- Maintenance and management functions in Staging NOT permanent
- Enhanced configurability

It's not just hardware and software

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Organisational readiness

Legislation and
strategies are not
sufficient

'No job will be
unchanged'

Chief Executive/
National Librarian
October 2007

Digital preservation requires interaction with all the organisation's processes and procedures -

- Business Processes
 - workflows, procedures and policies
- Capacity & Capability
 - resources and skills
- Performance Measures
 - reporting and measuring
- Internal Training
 - system & staff training
- Producer Management
 - service, marketing & training
- Business & Technical Support
 - between departments
- Communication
 - a constant

The NDHA challenge

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Challenge

If the only goal were to ingest and preserve digital content in complete isolation from the other systems and processes then digital preservation would be a much simpler task.

Organisational readiness

Resources, services and infrastructure supporting digital preservation

Integration with existing systems



Migration of digital assets

80,000 intellectual entities made up of around 280,000 files

Measuring success

60 key performance measures

Integration

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Integration work stream

It's not all about the Digital Preservation System

- Deposit applications development
- Existing collection management systems integration
- Browser based content delivery systems development
- Existing resource discovery and delivery systems integration
- Reporting systems
- Common services integration
- Data migration

Integration so far

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Milestones

Y

Y

Y

Y

Y

- Staff deposit application
- HTTrack to ARC converter utility
- Archived website migration tools
- OMS data migration tools
- Content aggregator
- Delivery viewers

What is



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INDIGO

Forms ...

Romanic: indicum,
indicus

Spanish: indico

Portugese: endego

Dutch: Indigo

NDHA: in dey go

Internal Submission Application

- Submission Information Package (SIP) Creation Tool (Templates, Hotkey support)

Packages up

- Files (supports complex digital objects)
 - Metadata (Structure map creation – METS)
 - Digital object structure – multiple representations
 - Fixity generation (MD5)
 - Links to descriptive record – CMS integration
 - Links producer records
- Submits SIP to the NDHA

Migration 1

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Object Management
System (OMS) 2005

What to do with all
our digital data

- Supporting Legal deposit while NDHA is developed
 - Published material deposited under Legal deposit
 - Digitised material from the Library's digitisation programme
 - Websites harvested as part of the Library's web archiving programme
 - Material will be migrated as new content

Migration 2

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Object Management
System (OMS) 2005

Data for testing end-
to-end DPS
functionality

- This will:
 - test initial workflows and process configurations
 - Impose the same metadata constraints (referential integrity, data validation)
 - Impose the same validation checks (fixity verification, virus check, format identification and metadata extraction)
 - Impose the same enrichment tasks (CMS identifier association, access derivative generation)

that will be applied in a live operational setting.

- This should give an indication of the amount of effort required to migrate the rest of the National Library's digitized content into the NDHA system.

Performance Measures

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How do we measure
what we're doing?

From widgets to
outcomes

- A move to management information with over 60 key performance indicators including:
 - Key performance indicators
 - Reporting
 - Audit
 - internal ingest
 - + response actions, ie for over/under delivery

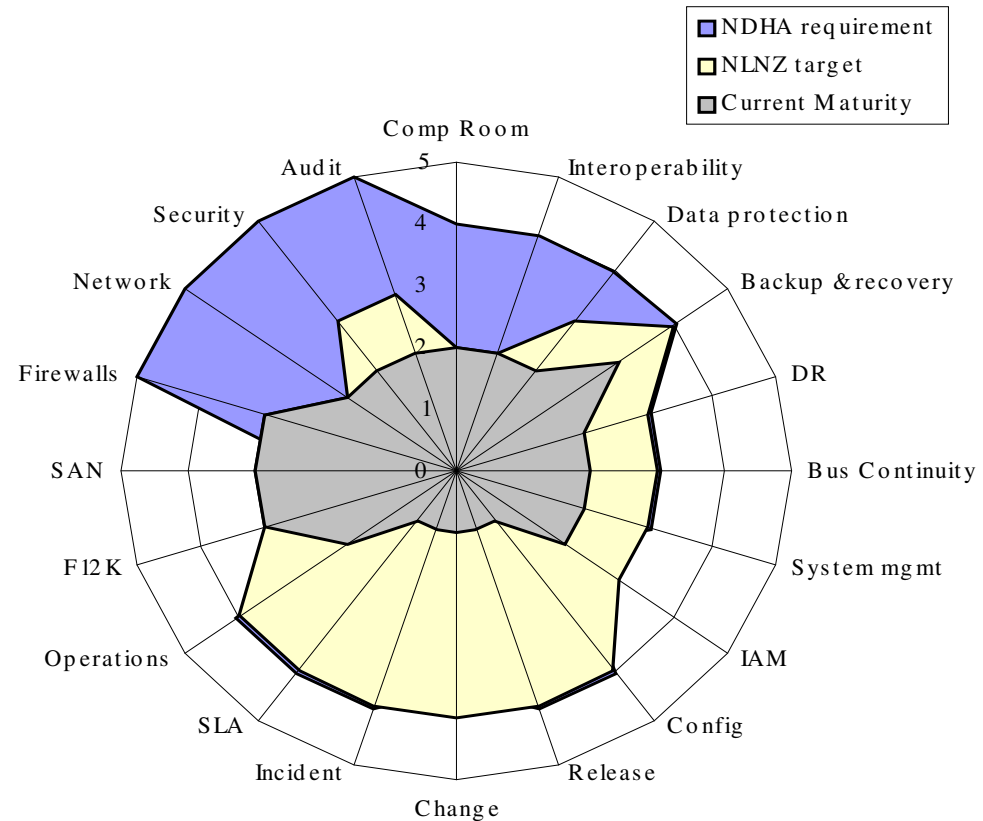
Technology infrastructure

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Maturity

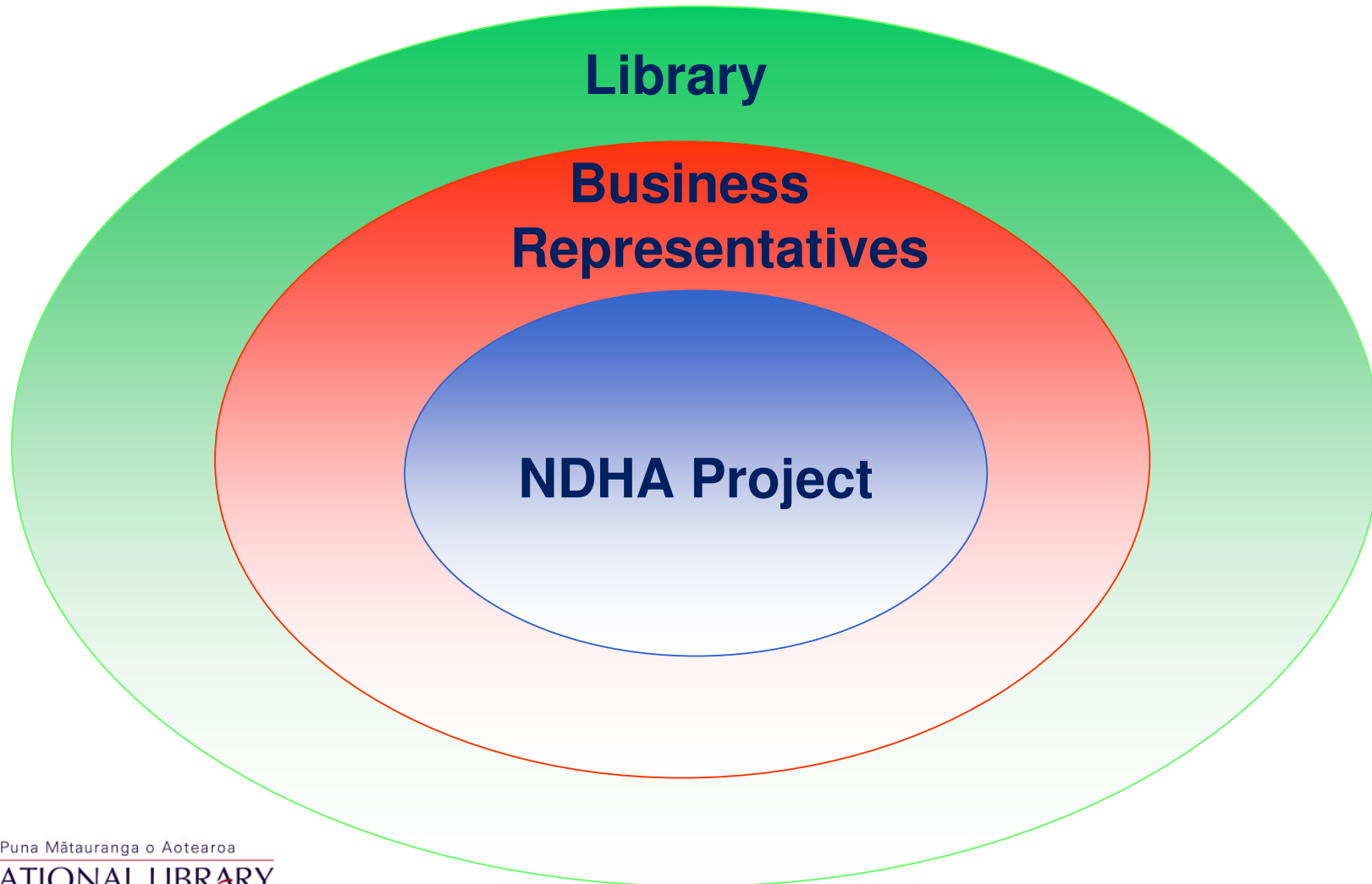
How ready is our infrastructure for digital preservation?

NDHA requirement, Enterprise target, Current Maturity



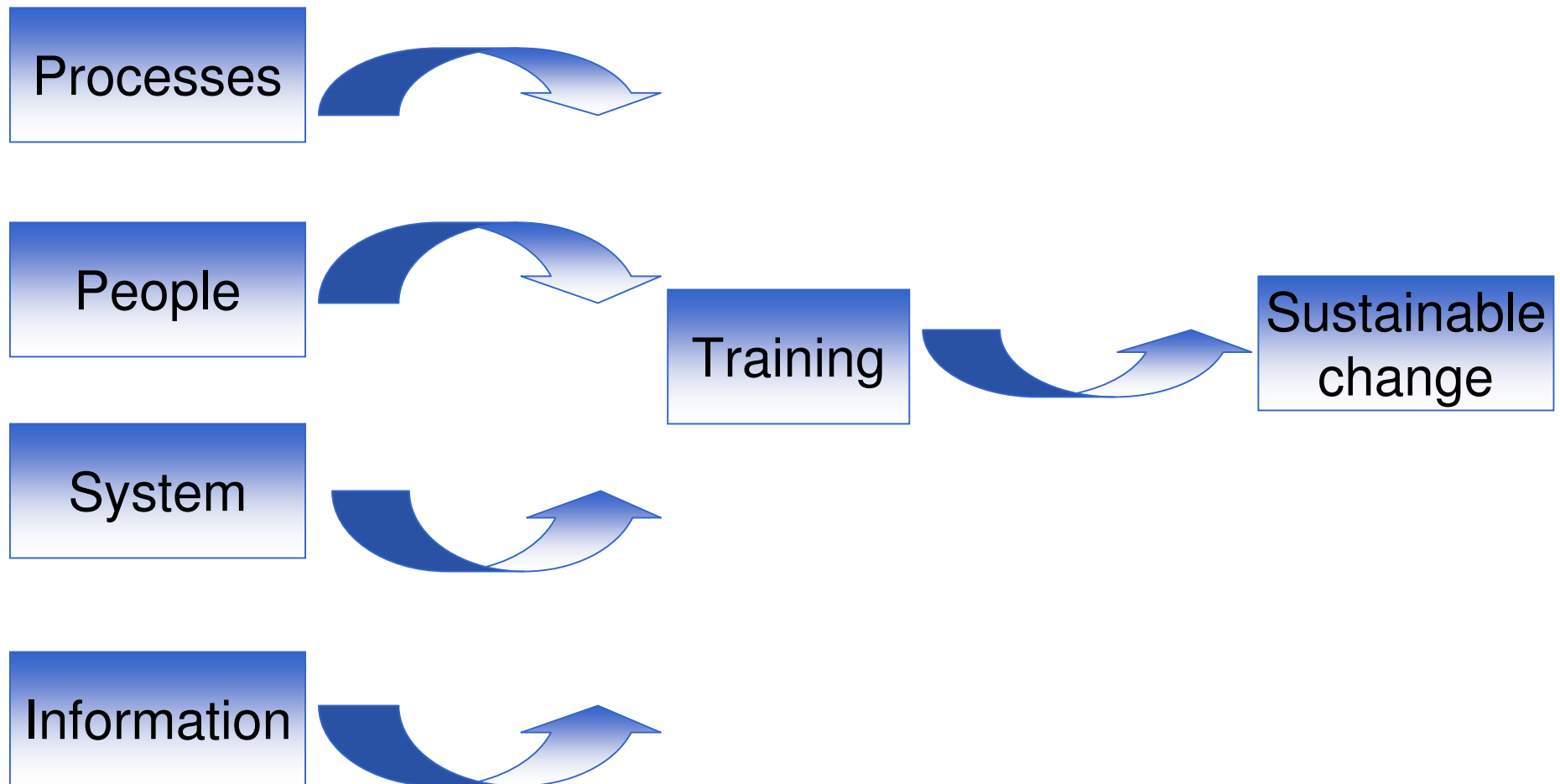
Business representatives
connect the Library to the project

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Staff Representation on the Project

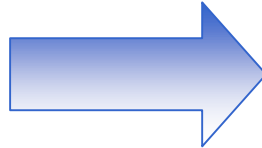
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Subject Matter Experts (SMEs)

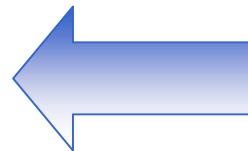
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Library



NDHA

- Ensuring that the NDHA solution and business change take into account Library needs
- Lead analysis as and when required



- Library experts on the NDHA

Business process

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Most Business
Representatives

Envision

- Map current processes ✓
- Design NDHA processes

Enable

- Review gap between current and future processes
- Contribute to development of high level implementation plan
- Support managers, curators and team leaders in developing local implementation plan

Enact

- Support local implementation

Performance measures

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Most Business
Representatives

Envision

Enable

Enact

- Propose measurement methodologies

- Support implementation

Internal training

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All Business
Representatives

Envision

Enable

Enact

- Advise on and review required adaptations to training materials and exercises for target audience
- Receive training

- Deliver training
- Provide NDHA expertise to Department

Producer management

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Most Business
Representatives

Envision

Analyse current producers
Identify future producers
Develop producer strategies

Enable

- Prepare communications for producers
- Contribute to development of generic producer workflows
- Develop individual producer workflows
- Identify producers for testing
- Adapt training plans and exercises for target audiences
- Receive training

Enact

- Deliver producer training
- Set up individual producer workflows
- Update training programme following evaluation

Business and technical support

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Most Business
Representatives

Envision

Review support requirements
Review current SLAs
Develop support plan

Enable

- Contribute to development of SLAs
- Design client support arrangements
- Design escalation arrangements
- Design transitional arrangements

Enact

- Support implementation

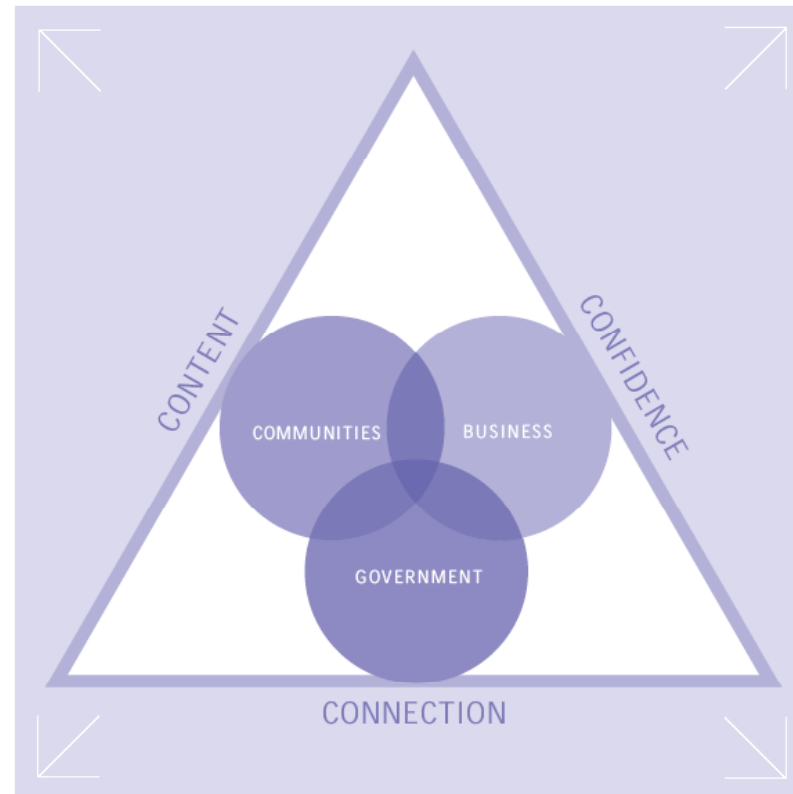
A National strategy

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New Zealand's Digital Strategy: the three Cs

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The 'C' framework

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connection

New Zealand will be in the top quarter of the OECD for broadband uptake by 2010.

content

To unlock New Zealand's stock of content and provide all New Zealanders with seamless, easy access to the information that is important to their lives, businesses, and cultural identity.

confidence

To provide all New Zealanders with the digital skills and confidence to find and use the information they need; and to ensure that telecommunications and the Internet in New Zealand are reliable and secure.

Five-Element Framework

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The power of five

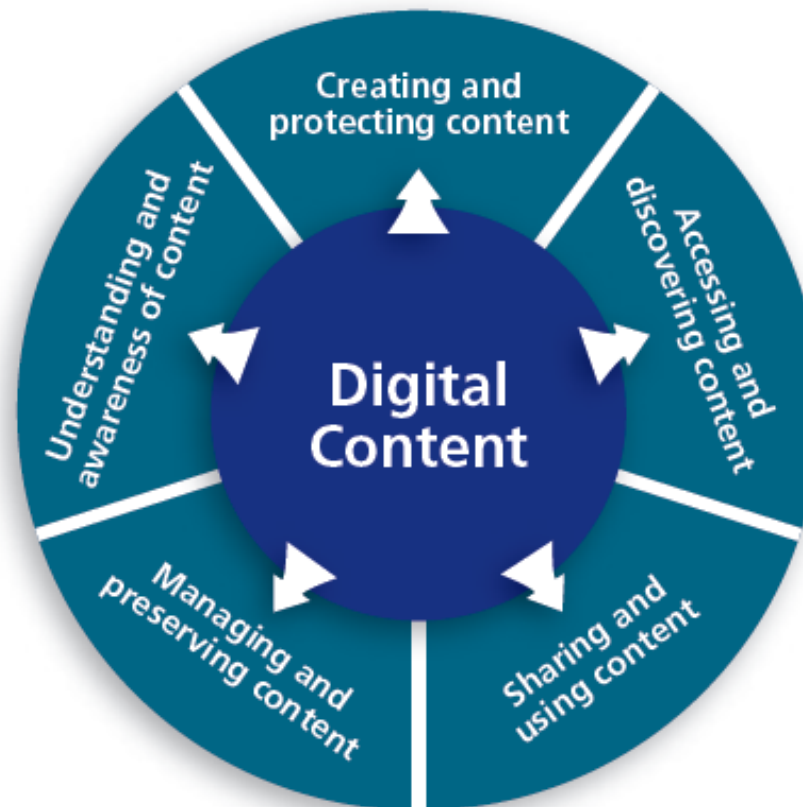
Creating and
protecting content

Accessing and
discovering content

Sharing and using
content

Managing and
preserving content

Understanding and
awareness of
content



The Digital Space

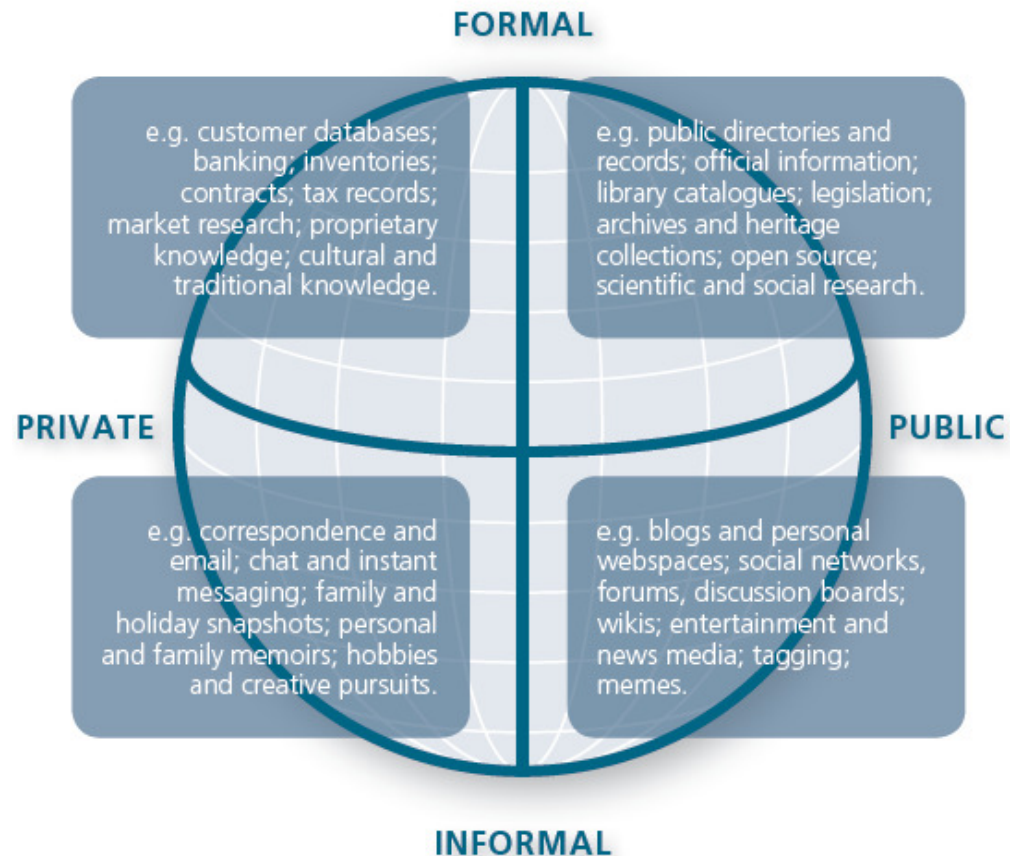
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A classification
system

Content as:

Formal/Informal

Public/Private



New Zealand Ideas

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Digital New Zealand

Joined up
government

Public access to
legislation

KRIS – NZ science
and research

Research data sets

Curriculum
resources

The public record



Digital New Zealand

Aotearoa People's
Network - community
repositories

Access Radio

NZ Film Archive

NZ Sound Archive

Te Ara – The Online
Encyclopedia

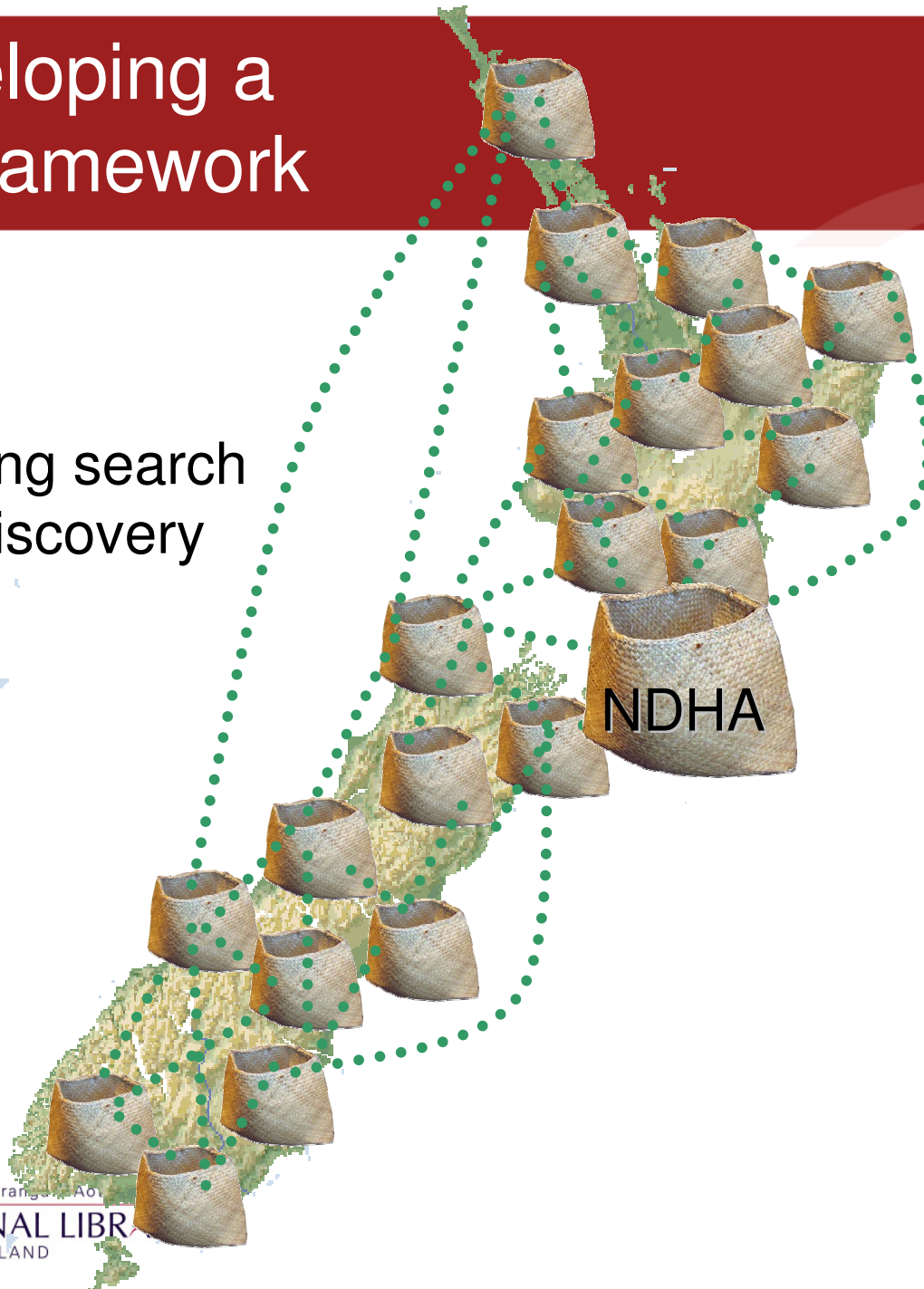
Broadcasting

Television

Developing a NZ framework

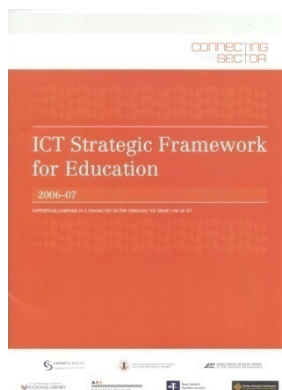
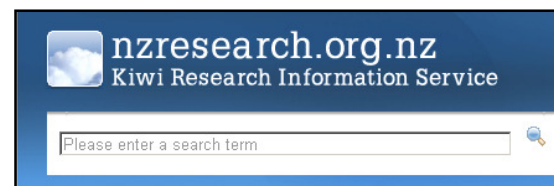
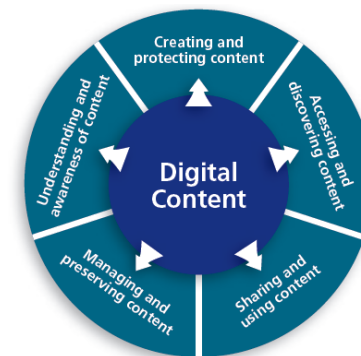
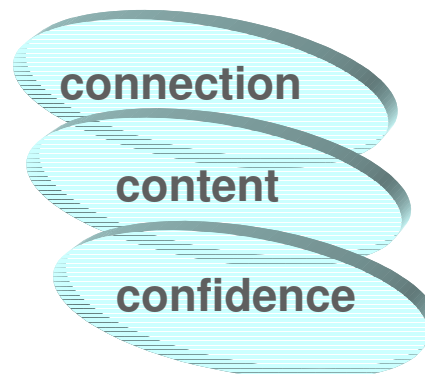
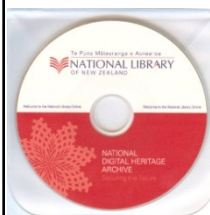
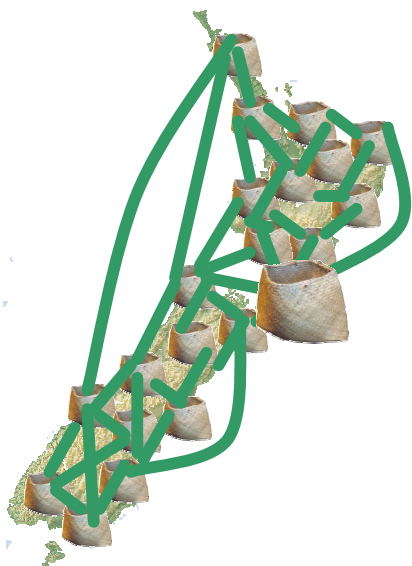
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Unifying search
and discovery
layer



Summary

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The 'C' framework

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connection

New Zealand will be in the top quarter of the OECD for broadband uptake by 2010.

content

To unlock New Zealand's stock of content and provide all New Zealanders with seamless, easy access to the information that is important to their lives, businesses, and cultural identity.

confidence

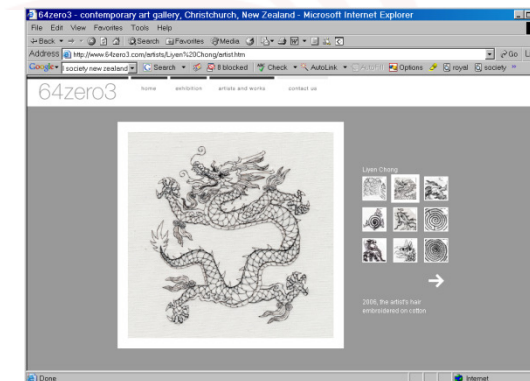
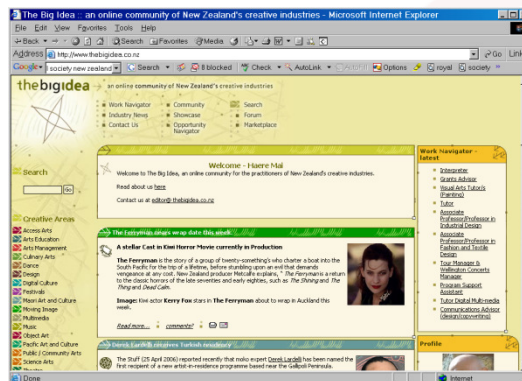
To provide all New Zealanders with the digital skills and confidence to find and use the information they need; and to ensure that telecommunications and the Internet in New Zealand are reliable and secure.

continuity

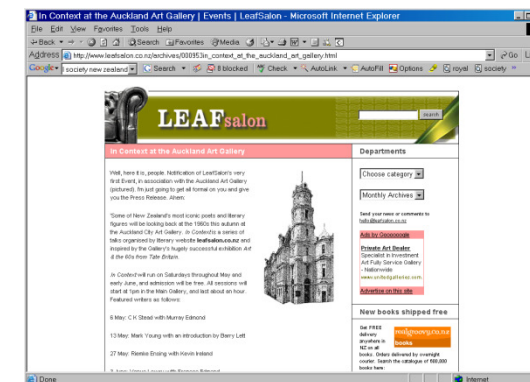
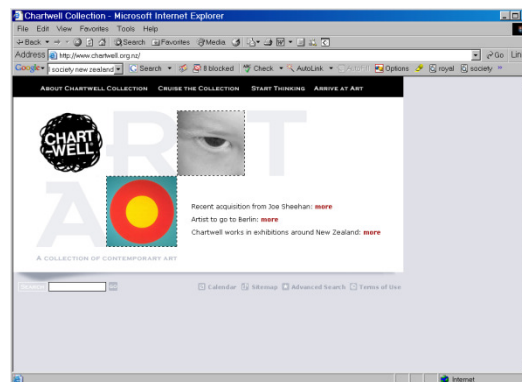
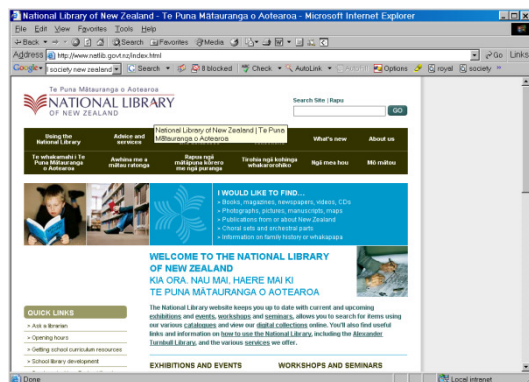
Digital preservation is the glue which will make this happen and where sustainability of our work in the digital domain occurs.

National Digital Heritage Archive

NATIONAL DIGITAL
HERITAGE ARCHIVE



Collecting, preserving and making accessible New Zealand's published digital heritage



Challenges Ahead

NATIONAL DIGITAL
HERITAGE ARCHIVE

Digital preservation
must be a national
issue

Does digital
preservation require
an international
response?

- Digital preservation is at the heart of our business in 5 years
- Citizen's created content impacting on our collection, description and preservation processes
- Content (ie digital preservation) systems are our core operational systems, not the catalogue
- Digital preservation as a component of a national knowledge infrastructure
- Quality assurance of products and tools
- Professional services market
- Agreed lexicon describing what we mean by digital preservation and what we want from digital preservation systems

Getting Everything right

NATIONAL DIGITAL
HERITAGE ARCHIVE

Preservation without content, content without description and search and retrieval and connection mechanisms, and search mechanisms without user friendly front end access are not sufficient in themselves. One missing element degrades the value of all the others. It is important to look at digital preservation in the context of an overall strategic and holistic approach to the surfacing of our collections.

National Libraries and National Identity

NATIONAL DIGITAL
HERITAGE ARCHIVE

What is a national library for?

“A National Library is a place where a nation nourishes its memory and exerts its imagination – where it connects with its past and invents its future.”

Pierre Ryckmans. 1996. “Perplexities of an electronically illiterate old man.” *Quad-rant*, September 1996, No 329.

Securing the Future

NATIONAL DIGITAL
HERITAGE ARCHIVE

Thank You

Steve Knight
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National Library of New Zealand