



World Library and Information Congress: 70th IFLA General Conference and Council

22-27 August 2004
Buenos Aires, Argentina

Programme: <http://www.ifla.org/IV/ifla70/prog04.htm>

Code Number: 085-E
Meeting: 157. E-learning Discussion Group
Simultaneous Interpretation: -

Next generation e-learning and digital library futures

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ABSTRACT

What have a nation's digital framework, e-learning and a digital library strategy have in common?

The National Library of New Zealand Te Puna Mātauranga o Aotearoa has a unique responsibility to all New Zealand school students and their teachers. While the Library has the legislative responsibility to provide access to the nation's documentary heritage, and to preserve this heritage for future generations to explore and enjoy, it also has the responsibility to provide resources to support all facets of the New Zealand school curriculum. Increasingly, these resources are in an e-paradigm, which will be drawn into the next generation's learning experiences in a seamless, learner-centric way.

We have heard the lament of educators internationally about e-learning as a technology rather than a pedagogical driver. As we explore next generation e-learning we can feel assured that the digital library, in all its manifestations, will impact on, influence and perhaps radically change the pedagogy of the next generation e-learner. This paper explores the potential of this paradigm and develops the thinking behind the architectures which will underpin a country's e-learning strategy.

As with other parts of the world, NZ has fostered excellent 'cottage industry' developments in e-learning from schooling through to higher learning. While we learnt much from these developments we have lacked an all-of-country strategic framework which is centred on learners and can be scaled up to expose the digital library in all its manifestations in the next generation e-learning pedagogy.

During the first months of 2004, good progress has been made to develop a coherent national digital strategy for New Zealand which will move towards an open systems, standards-driven architecture which achieves high levels of interoperability between e-learning and digital library experiences.

This paper explores the opportunities a national approach offers to the flow of information in a country and the crucial place that learning and information will play in achieving this vision.

KEY WORDS

e-learning, digital, library, information, strategy.

The importance of developing a standards based framework for the flow of information across a country was promoted by the Library Association of New Zealand Aotearoa (LIANZA) in 2000.[1] The information strategy proposed by LIANZA built on the 3Cs framework which came out of the **Keystone for an Information Age: a national information strategy for the UK early in 1999**. [2] and argued that there were three generally accepted components or building blocks in facilitating the access to information in an e-environment. [Figure 1]

In 2002 Te Rōpū Whakahu (Māori in Libraries and Information Management) [3] strengthened the LIANZA strategy by contributing a Māori perspective on mātauranga Māori (Māori knowledge). The three ‘c’s are described as nga kete o te wananga (three baskets of knowledge). The contribution of Te Rōpū Whakahu is particularly significant in a New Zealand context because it brought an indigenous knowledge perspective to our understanding of information and information access. It also demonstrated the commitment to partnership inherent in the Treaty of Waitangi (a document signed in 1840 between Maori and the British Crown) which today is fundamental to New Zealand’s constitutional framework and sense of national identity.



Figure 1

THE WORLD SUMMIT ON THE INFORMATION SOCIETY (WSIS), GENEVA NOVEMBER 2003

The ‘Declaration of Principles’ resulting from the World Summit on the Information Society [4] in Geneva in 2003 provides us with useful high level principles from which we can draw more practical applications

The National Library of New Zealand Te Puna Mātauranga o Aotearoa was able to make a useful contribution at the WSIS. As a government department in its own right, the National Library was appointed as the lead agency for the NZ delegation and accompanied the Honorable David Cunliffe, Associate Minister for Information Technology, presenting New Zealand's perspective. We were, I think, the only National Library present as a lead agency. This meant that non-government organisations such as IFLA had minimal direct input into the summit and they relied heavily on delegations such as our own to strengthen the statements around the importance of equitable access to information and the importance of this to the social, economic, educational and research aspirations of a country.

The WSIS promoted the desirability of countries developing e-strategies and in June 2004 the Cabinet of the New Zealand Government passed a draft National Digital Strategy for New Zealand to go out for consultation and final approval by September 2004. The National Library will facilitate the consultation on behalf of the Government with the culture and heritage and library and information sectors.

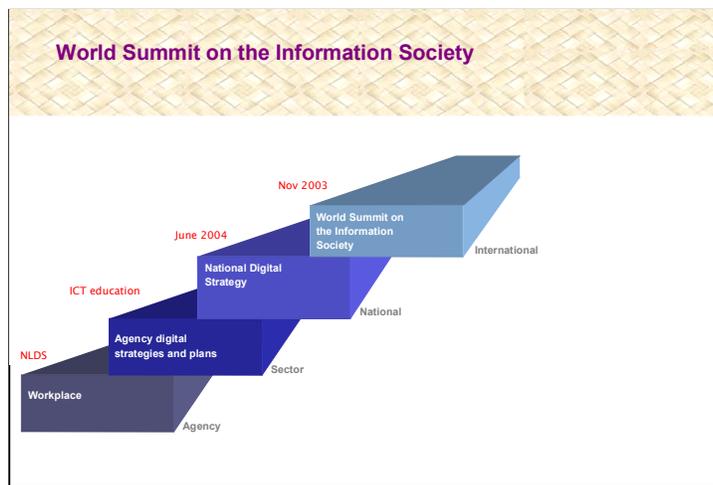


Figure 2

Understandably there is much anticipation from the Library and Information and Education sectors. LIANZA will see the three 'c's which reflects their thinking in the strategy and two other 'c's, collaboration and continuity (digital preservation) will also feature.

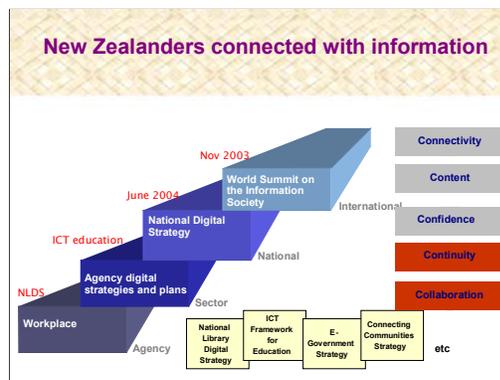


Figure 3

By the end of the year we think there will be a national digital framework which provides a good foundation from which next generation e-learning and digital library architectures can be developed.

WHY IS A NATIONAL DIGITAL STRATEGY RELEVANT TO NEXT GENERATION E-LEARNING AND DIGITAL LIBRARY ARCHITECTURES?

As with other parts of the world, NZ has fostered excellent ‘cottage industry’ developments in e-learning from schooling through to higher learning. While we have learnt much from these developments we have lacked an all-of-country strategic framework which is centred on learners which can be scaled up to expose the digital library in all its manifestations in the next generation e-learning pedagogy.

The national Digital Strategy is likely to provide the high level vision for New Zealand which delivers an interoperable standards based framework where information can be moved relatively easily from one environment to another. The framework builds on the WSIS Declaration of Principles [4]:

- “20 Connectivity is a central enabling agent in building an information society*
- 30 The use of ICTs in all stages of education, training and human resource development should be promoted*
- 32 Content creators, publishers, and producers, as well as teachers, trainers, archivists, librarians and learners should play an active role in promoting the information society”*

If we are to maximise all of the advantages of the next generation e-learning and digital library environments then we must achieve this level of interoperability, interaction and seamlessness. The vision of creating an “unseemly” learning environment is particularly appealing because it implies some sense of levity and fun as well!

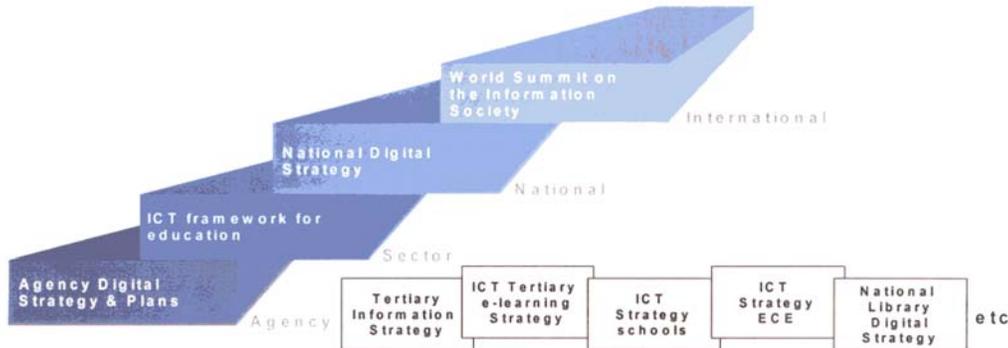
AN ICT FRAMEWORK FOR EDUCATION

The building blocks outlined in *figure 2* illustrate how important the **international** (WSIS) and **national** (National Digital Strategy) have been to developing a coherent ICT framework for education in NZ. In June 2003 the Minister for Education, the Honorable Trevor Mallard established an ICT Steering Committee for Education to achieve a joined up ICT architectures across the education **sector**. The joined up framework would involve all sectors in education including early childhood, compulsory sector (schools), and tertiary - universities, polytechnics and wananga (Māori universities). It is an ambitious project and much progress has been already made. Chief executives from all of these sectors are charged with delivering this framework and, importantly from a library perspective, the Chief Executive and National Librarian sits on the steering committee. This brings the next generation strategic thinking for e-learning and digital libraries close together.

While the ICT framework is still being developed the high level thinking is nearing completion and it is likely to link strongly with the National Digital Strategy (see *Figure 4* on next page)

Education Sector ICT Vision

ICT Framework Building Blocks



ICT: Education Components

Connectivity

A national standards-driven ICT infrastructure for education

Content

E-content from a variety of sources, and repositories: many purposes and users to support teaching, learning and research

Capability

All New Zealanders have the skills needed to turn information into knowledge

Continuity

Preserving New Zealand's digital heritage for future generations of learners

Collaboration

A seamless across-education framework

Linkages

ICT: Education Components	Settings			
	Teaching, Learning and Research	e-Learning	Administration	Technology
Connectivity	<ul style="list-style-type: none"> - Learner expectations re. ICT - Increased learner ICT skill level - Options increase through ICT. 	<ul style="list-style-type: none"> - Shared resources and teaching programmes - Options increase through ICT - Interoperability 	<ul style="list-style-type: none"> - Online enrolment and access to learning opportunities. - Options increase through ICT. 	<ul style="list-style-type: none"> - Standards - PROBE - NGI - Portals - Video Conferencing etc
Content	<ul style="list-style-type: none"> - TKI, National Library and other repositories - Learning Fed - e-journals - e-text - e-prints 	<ul style="list-style-type: none"> - TKI, National library and other repositories - e-journals - e-text - e-prints 	<ul style="list-style-type: none"> - e-data - e-business - e-reporting 	<ul style="list-style-type: none"> - Alignment of SMS - Alignment of agency appropriations
Capability	<ul style="list-style-type: none"> - For learners and teachers - Online learning - PD in schools - Inhouse - tertiary 	<ul style="list-style-type: none"> - For learners and teachers - Online learning - PD in schools - Inhouse - tertiary - Digital Literacy 	<ul style="list-style-type: none"> - For learners and teachers - Online learning - PD in schools - Inhouse - tertiary 	<ul style="list-style-type: none"> - Architecture - Capital Investment - NGI
Continuity	<ul style="list-style-type: none"> - Archival Material - Trusted digital repository ie. Museums 	<ul style="list-style-type: none"> - Archival Material - Trusted digital repository ie. Museums 	<ul style="list-style-type: none"> - Data Warehouses - Data 4 U 	<ul style="list-style-type: none"> - Architecture - Portal access - Authentication - Security
Collaboration	<ul style="list-style-type: none"> - Between NZ and Australia - Interagency - Interprovider 	<ul style="list-style-type: none"> - Between NZ and Australia - Interagency - Interprovider 	<ul style="list-style-type: none"> - Interoperability between providers, between agencies and between providers and agencies - Standards 	<ul style="list-style-type: none"> - Shared Infrastructure
Suggested 6 th C				
Cost Effective				

Principles

* Learner Centred * Good Practice * Innovative * Affordable * Collect Data Once * Interoperable * XML/Web based * Ownership

Education...an innovative sector, fully connected and supported, by smart use of ICT.

Figure 4

At this stage it may be useful to unpack the 5 Cs in the ICT framework for education (*Figure 5*) in relation to e-learning and digital library architectures to explore what we might see as the ICT framework develops.

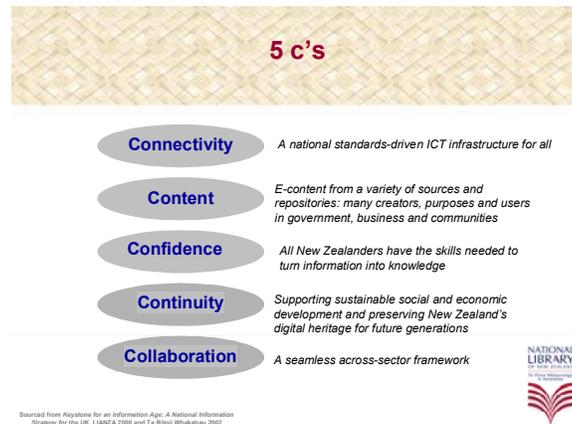


Figure 5

CONNECTIVITY

The vision is to *develop a national, standards driven infrastructure for education*. Across education sector working parties have been established to agree to common standards driven architectures. Interoperability standards including metadata schema and federated searching capability are all part of the connectivity mix. Increased bandwidth is being rolled out under the PROBE and Next Generation Internet projects. This will ensure that all schools will have broadband and the research community will be able to access megabytes of research data. [5] (*Discussion document for a New Zealand advanced network*)

CONTENT

It is generally agreed that *there will be content from a variety of sources and repositories* which will have *many purposes and users to support teaching learning and research*. Clearly libraries are significant content contributors in learning teaching and research. The digital library in all of its manifestations (e-publishing, e-print, digitisation etc) will provide content for next generation e-learning environments

CONFIDENCE/CAPABILITY

“all New Zealanders will have the skills to turn information into knowledge”

In the National Digital Strategy focus has been placed on the need to address issues related to the digital divide. Digital and information literacies are embedded in the practice of most educational and public libraries. It is generally accepted that while a country may have excellent connectivity and e-content, learners are disadvantaged if they are not functionally literate and able to take advantage of the digital age.

COLLABORATION

A joined-up standards driven *“seamless across education framework”* ICT framework will only be achieved through a spirit of collaboration. Cultural interoperability (people connecting with each other) can sometimes prove as difficult to achieve as technical interoperability. In relation to collaboration in New Zealand there is a positive environment. Ainslie Dewe, University Librarian at the Auckland University of Technology, and Chair of the Library and Information Advisory

Commission, refers to the spirit of collaboration in her paper “*A New Era in Library and Information Collaboration in New Zealand.*” [6]

CONTINUITY

In the 2004 budget, the National Library received \$NZ24 million from the Government to build a trusted digital repository for digital preservation. The Library will be “*preserving New Zealand’s digital heritage for future generations of learners*” to explore and enjoy.

IMAGINING THE NEXT GENERATION E-LEARNING/DIGITAL LIBRARY ENVIRONMENT

Imagine a connected country with ubiquitous bandwidth, high levels of systems interoperability based on international standards and compatible metadata schema. Traditional siloed systems are now open and easily accessible. E-learning experiences are both scalable and accessible while still able to be designed to meet an individual learner’s needs.

E-content is easily accessible from a variety of sources and subject disciplines. Learning objects, e-publishing e-print, digitised images, digitised sound, vision geospatial data can be drawn unchallenged into the next generation e-learning environment through various channels, including federated searching.

Educators/creators are no longer bound by the constraints of old generation Learning Management Systems (LMS) and nor is the learner. These systems are still useful delivery platforms however a more flexible design space is now available and at long last the pedagogy begins to drive the technology. The educator/creator has a flexible design capability at their fingertips, content is now the servant of the pedagogy and is drawn into the design space to be reused, repurposed, and re-sequenced to connect with the individual needs of the next generation learner.

To a much greater extent than ever before the learner can explore and create and add to an e-learning experience themselves. The digital library in all of its manifestations is liberated into the e-learning environment and is at the fingertips of the next generation learner who now can move seamlessly from one environment to another. Learner-centric pedagogy takes on new meaning as the learner interacts with the educator and at times chooses to move from the prescribed e-learning experience into a world of discovery and exploration of their own. Previously discrete worlds of learner, educator, librarian and IT specialist are more blurred, seamless and accessible. Imagine!

NEW ZEALAND/AOTEAROA: A LEADING INFORMATION DEMOCRACY

There are encouraging signs that New Zealand will make significant progress in achieving the aspirations of the next generation learner during the next 12 months. Libraries throughout the country are in a strong position to play a crucial role in this development.

The National Digital Strategy will be in place with bandwidth rolled out across the country into rural areas by the end of 2004. Sectors which have previously functioned as silos will be much more joined up. The ICT vision for education for example will see a **connected** education sector, from early childhood through to the tertiary sector, there will be one e-learning strategy across education. The Tertiary Education Commission, established in 2003 to achieve a joined up education sector will begin to see this vision realised.

New Zealand libraries will position themselves to be major **content** providers in the e-learning environments of the future. The Library and Information Advisory Commission (LIAC) will map the information landscape of the county and achieve its vision which is to see “*New Zealand: Aotearoa as a leading information democracy.*” [7] The library and information sector will **collaborate** further to purchase further e-journals for “every citizen, every New Zealander” accessed through the libraries of

New Zealand. The EPIC project (Electronic Periodicals In Collaboration) [8] will expand on the 16,000 + e journals from GALE and EBSCO and these journals will be drawn into the e-learning environments of all kinds across all sectors. New Zealand **content** will be liberated through a window of digitised images, sound and vision from our art galleries, museums, archives and libraries. Images from the Matapihi (window) project [9] deliver relevant New Zealand content into e-learning design. Discover [10] will signal a development of the future which will expand content choices particularly to support schools curriculum needs in the compulsory sector.

The National Library will play a leadership role in preserving New Zealand’s digital heritage. The \$NZ24 million announced in the Government’s May 2004 Budget will help to develop and build a trusted digital repository [11] to preserve New Zealand’s digital memory. This will ensure there is **continuity** so that future generations can explore and connect with our digital memory recorded on web sites in digital publishing, sound and vision. The risk of facing digital amnesia or the digital dark ages when we seek to explore and understand our digital memory is a concern to the international community.

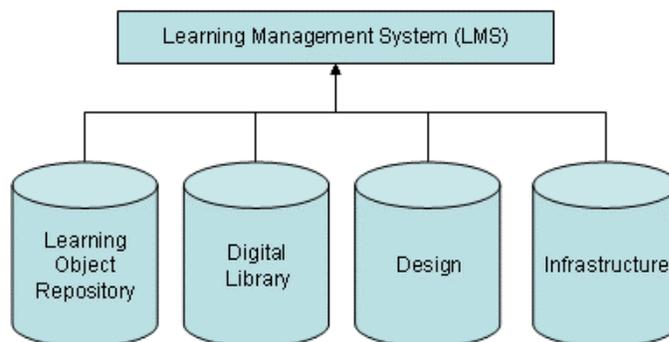
The National Digital Strategy will be concerned to address the “digital divide” the gap between the information haves and have-nots will be narrowed [12]. Public libraries will strengthen their role as “infomediaries” by helping to connect New Zealanders to connect with information important to all aspects of their lives. The **confidence and capability** of New Zealanders will increase as they become digitally and information literate and able to take full advantage of the digital age.

The National Digital strategy will increase awareness about the importance of confidence in realising the potential of the digital age. There will be a realisation that while we may achieve a connected country and provide access to e-content in all of its manifestations, New Zealand will not become a leading information democracy if its citizens are not enfranchised with the functional literacies to take advantage of these opportunities.

The Next Generation e-learning digital library architectures in New Zealand.

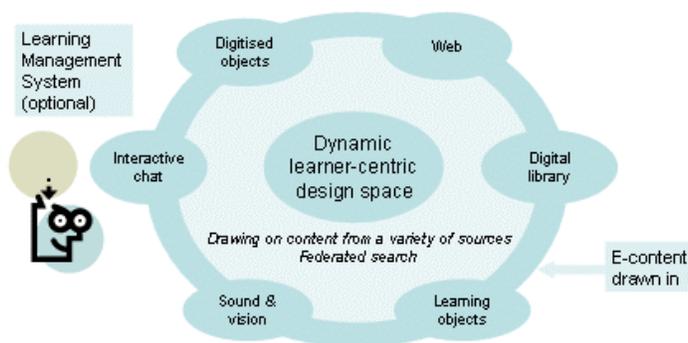
Old generation e-learning

- Focused on globalisation of delivery rather than the individual learner
- Poor systems interoperability and connection achieved
- Seen to be static – an old paradigm



New generation e-learning

- Learner-centric while scalable
- High levels of systems interoperability and connection
- E-content liberated into pedagogy
- Open systems, international standards underlay
- Seamless, few boundaries or barriers



REFLECTIONS AND CONCLUSIONS

This paper has argued that in order to develop a seamless, accessible, learner-centric next generation pedagogy that is scalable, sustainable, and will achieve a high level of systems and cultural interoperability, countries need a National Digital Strategy and an ICT vision for education, to bring this framework together. Only when this happens can communities of interest (for example, education and libraries) work together towards developing and delivering online experiences that move in a transparent way from one community's rich content layer to another.

Libraries have a long history and deep understanding of standards-led architectures which achieved greater access to information and systems interoperability. It is therefore a natural position for the profession to be a proactive partner in the development of next generation e-learning experiences.

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