Discovernet©: building an education gateway

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ABSTRACT
Australian Museums and Galleries OnLine (AMOL) recently launched Discovernet©, a learning gateway to Australian cultural institutions and the quality educational resources they produce. Research for the development of Discovernet© showed that while children under the age of 14 used the Internet regularly, few online education products were designed specifically for this younger age group. The interface and schema for Discovernet© have been greatly influenced by the idea that young children are active users of the Internet and a portal such as Discovernet© has enormous potential to promote museums and museum objects as places and tools of learning and discovery.

Discovernet© comprises four sections: an interactive game called *Make your own exhibition* that uses real museum objects to introduce children to the curatorial process; a national database of museum education resources called *Study Booster* that incorporates specialist education metadata; a museum guide for students and teachers; and an *Australian Tales* section that presents historical or social contextualisation of the museum objects in AMOL's distributed national database, tied to curriculum objectives.

This paper looks at the advantages of the gateway model for museums' educational content on the web and the issues encountered in the building of Discovernet©, including the importance of active learning strategies in online education and the application of specialist education metadata.

Discovernet© was launched in conjunction with a web cast from a megafauna fossil dig in the Australian desert.

KEYWORDS: education, gateway, discovernet, active learning, education metadata, curriculum objective, children, students, interface design

INTRODUCTION
Australian Museums and Galleries OnLine (AMOL) is an established Internet gateway to Australia's cultural institutions. AMOL is a collaboration between government and the museum sector, and is currently based at the Powerhouse Museum in Sydney. AMOL serves the museum community through a series of professional online resources and tools, and the general public through a comprehensive online guide to Australian museums and galleries. Access to many of the nation's collections is also provided through a distributed national database of collection records that is continually growing.

AMOL's attention has turned recently to the education sector - one of the

biggest visitor groups to museums and a consistent consumer of online resources. Almost all Australian schools, libraries and universities are now online and the Internet is widely accessed by children at school and at home. 95 percent of Australian children aged 5 – 14 have used a computer in the last twelve months and 46 per cent have accessed the Internet in the last twelve months (ABS, 2000). 46 per cent of Australian households with children under the age of 18 have access to the Internet at home (ABS, 2000).

Museums produce a wealth of dedicated educational products apart from their core exhibitions. These include publicly accessible databases, websites, online exhibitions, interactive material, travelling exhibitions, 'exhibitions in a box' and teacher and student packs. (Museums also importantly have human education resources, such as education officers, curators and researchers.) Even though most Australian museums have their own website, cross-institutional searching for complementary educational resources is problematic as metadata is in many cases sketchy and not particularly consistent with emerging Australian and international standards.

Discovernet© was conceived as a means to provide standardised, national access to the quality educational resources Australian museums produce and to promote museums and museum objects as places and tools of learning and discovery. A baseline user group of 8-12 year olds was drawn from research indicating that although young children regularly access the Internet, few museums are developing online products targeting children in younger age groups (Sumption, 2000).

We did not have the resources to build a gateway that could be all things to all children, and we have used this mid-range age group more than anything as a departure point for the exploration of an education gateway model.

Together with this target age group, three important features have informed the development of Discovernet©: active learning strategies; access and interface design, and quality data linked to curriculum objectives.

ACTIVE LEARNING – BALANCING EDUCATION AND ENTERTAINMENT ONLINE

The shift in recent years from didactic learning experiences to active learning in museums, where visitors can make their own meaning through interaction with objects, has had a significant effect on online museum education (Sumption, 2000). Undoubtedly the most important aspect of this shift for those of us designing products like Discovernet© has been the focus on interactivity, where children can make their own choices and possibly engage in creative play at the same time as retrieving information.

One of the most fundamental challenges of Discovernet© was not only to create an effective 'portal within a portal' (sitting as it does within AMOL's larger framework as an online gateway to museums and galleries) but also to achieve a balance between its educational and entertainment values.

Figure 1: Discovernet© homepage

We made extensive reference to existing active learning 'typologies' such as:

- Education meta-centres – where data-rich resources such as large databases are made available for comparison, investigation and evaluation;
- Expository teaching resources – highly structured computer-directed activities presenting a set of principles, laws or theories (or in our case, curriculum objectives); and
- Creative play – encouraging children to explore and test ideas through creative activities and the act of making. (Sumption, 2000)

While a combination of these typologies features in all four sections of Discovernet©, the last of these - creative play - features most prominently in the interactive game *Make your own exhibition*.

Make your own exhibition – creative play for learning

Make your own exhibition is an introduction to the curatorial process and the making of meaning in museums, designed for 8 – 12 year olds. The game is explicitly tied to curriculum objectives such as interpreting text and understanding context, writing and investigation. Using real museum objects drawn from one or several museums, *Make your own exhibition* asks students to choose artefacts, read fact sheets and write labels to go with each object as if they were compiling a real exhibition. At the end of the game the exhibition is displayed to an animated crowd who pass in front of the exhibits making positive and sometimes humorous comments about the exhibition.

A Kookaburra character (a Kookaburra is a native Australian bird) plays the role of the senior curator, giving information and instruction and guiding the child through the game. While *Make your own exhibition* allows certain creative freedom in the choosing of objects and the writing of labels, the parameters of the game are also moderately prescriptive, addressing metacognition problems that can occur with younger users who are offered *too many* choices (Sumption, 2000). Flash animation and cartoon-like illustration have been used to enhance the idea of fun and an accessible interaction with museums.

Figure 2: A cartoon character of a native Australian bird is the children's guide through 'Make your own exhibition'

Like several other online games of this type, Wildlife art tales (http://www.wildlifeart.org/arttales/) and MOMA's art safari (http://artsafari.moma.org/safari_menu.html) to name a few, *Make your own exhibition* seeks to enhance an active learning experience with creative play, based on the idea that museum learning is created through the experience of real objects (Clarke, 2001) as well as by the choice and control of the experience (Falk and Dierking, 2000).

ACCESS AND INTERFACE – APPEAL VS. SPEED

The Internet provides a country as big as Australia with many opportunities for overcoming its geographical barriers to communication. A student living in Western Australia can access information held in a Tasmanian museum thousands of kilometres away via the Internet. Living in rural areas no longer means the only access to museums is through a physical visit to an urban centre. Although the Internet does not replace these real museum visits, there is considerable educational worth in this remote access both for the student and for the museum that has a responsibility to provide the best possible access to its collection and knowledge.

There is however a wide variation in technical infrastructure across Australia, and our use of multimedia had to be carefully weighed against issues associated with download speed.

A second fundamental access issue was the interface design. Although the site had to be quick to download, it also had to have considerable graphic appeal for children, limited amounts of text and text instructions, and, in many cases, use graphics to explain or navigate the site. After looking at hundreds of portfolios, we found an illustrator with diverse experience who produced a series of engaging characters and a 'look-and-feel' to accompany the site's activities and content. In many cases we have used these characters as a structural device – playing the part of peer-guides who give navigation or explanatory instructions.

QUALITY DATA LINKED TO CURRICULUM OBJECTIVES

Museums are uniquely positioned as authorities on the subjects of their collections and many already produce tailor-made education products linked to curriculum objectives. In an online world crowded with as much information garbage as treasure, the authentic content of museums' educational resources provides a critical mass of quality data for an information portal like Discovernet©.

Discussions with teachers in the developmental stage indicated that although they were very interested in

museums' educational resources, many felt they did not have the time to seek appropriate resources for their class activities. Many saw an Internet gateway to these resources as a valuable, time-saving solution.

Constant reference to curriculum objectives was thus vital to the planning process and within the gateway model of Discovernet© this has shaped both the choice and the classification of resources.

Study Booster – Dublin Core extensions and specialist education metadata

The standardisation of complex information in large databases has thankfully become a global trend, driven by the development of the now widely applied Dublin Core (DC) metadata standards.

Like several other areas dealing with large databases of archived specialist material, the education sector has been active in developing extensions to the DC fields to cater for their specialist search requirements. (Dublin Core project, 2001) In Australia, the education portal EdNA, (Education Network Australia – a collaboration between government and the education sector), has produced its own DC-compatible standards for metadata. Version 1.1 of EdNA metadata was ratified in December 2000, and extends the core DC set with fields for education sectors, institutional levels and reviews. (EdNA, 2001) This allows resources to be catalogued down to a very specific keyword set for each school year, as well as levels of academic qualification, for example Certificate level I according to the Australian Qualifications Framework. Review and reviewer indicate the presence and identity of a third party review of the resource.

Study Booster incorporates the EdNA fields together with the standard DC set and an additional set of Australian Government Locator Service (AGLS) metadata standards. AGLS was developed in late 1997 as the resource discovery metadata standard to describe both online and off-line Australian government resources. This of course includes resources produced by Australian public cultural institutions. Although it seems cumbersome to have nearly 35 metadata fields filled for each resource, the use of all of these fields in *Study Booster* is important for a long-term compatibility with national and international standards as well as efficient retrieval of resources from a database that will eventually contain thousands of records.

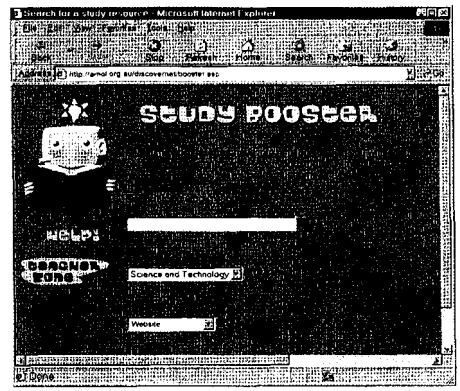

Figure 3: The *Study Booster* interface for students

Study Booster has much in common with databases of museum educational resources like the 24 Hour Museum's Curriculum Navigator (http://www.24hourmuseum. org.uk) and the Virtual Museum of Canada's Teachers' Center

(http://www.virtualmuseum.ca/English/Teacher/). The target audience of school children for Discovernet© has however dictated the focus and design of *Study Booster,* which seeks to present a simplified and intuitive search interface for children.

From the first screen, children can use a text search, search by subject or search by type of resource (website, audio, video, print etc.). A secondary interface for teachers allows searching by curriculum links, educational objectives and relevance by school year. A classification schema for each resource was developed with the dual search requirements of both groups in mind.

Museum Locator and Australian Tales – 're-purposing' quality content for an education audience

The value of re-utilising quality content and data sets in different museum applications is well documented (Garzotto and Paolini, 1999). We found that this approach has many benefits when applied to the education sector and to databases that AMOL maintains and develops.

Re-utilising the content of our existing Guide to Australian Museums and Galleries, we developed a *Museum Locator* with an interface that resembles an alien spaceship console. Children can locate the nearest museum through an interplanetary search or search for a museum by type or collection. By the use of cartoon-like graphics to illustrate the idea that finding a museum could be fun and an adventure, we again hoped to add an element of play to an otherwise dry yet useful information resource.

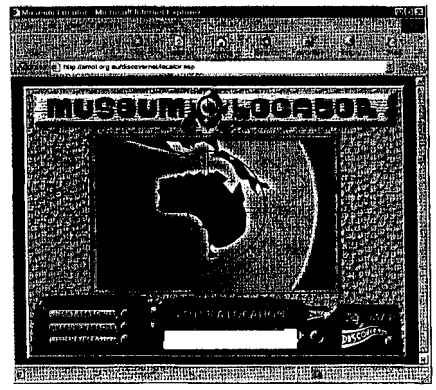

Figure 4: Museum locator

As the Kookaburra in *Make your own exhibition* guides the child through the making of an exhibition, an alien character accompanies the child's search through the *Museum Locator.* The structural device of a cartoon character as informative guide has also broadened the education scope of a database such as this one. For example, when a result field appears after a search, so does the alien with a pop quiz, such as 'Do you know what a maritime museum collects? Do a search by museum type to find out!'

Australian Tales also employs the idea of 're-purposed' content, making use of a rich collection of museum stories developed by AMOL. These stories from museums and galleries are generated periodically when institutions place their collection records in AMOL's distributed national database. Their purpose is essentially value-adding to data sets, placing real objects from these databases in an historical or social context. The stories function as mini online exhibitions and often make use of some form of interactive multimedia.

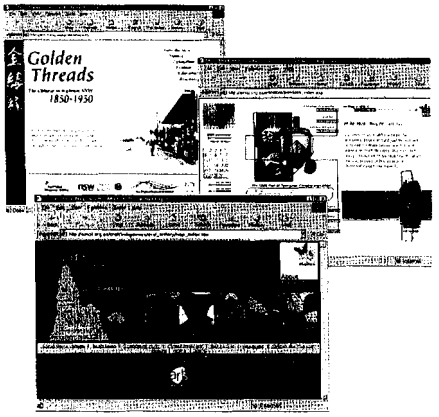

Figure 5: Examples of AMOL's stories from museums – Golden Threads: the history of the Chinese in regional New South Wales, the Pandora marine excavation, and Indigenous oral histories from Far North Queensland

Conceptual and contextual frameworks are crucial to cognitive learning in museums (Ham, 1994). For Discovernet© to be truly valuable as a teaching tool, it was important that contextual frameworks such as those of the stories be relevant and related to curriculum objectives. *Australian Tales* seeks to do this through the addition of 'encyclopaedic' stories to the existing stories. These are brief contextual histories or stories linked specifically to syllabus topics that present relationships between objects in AMOL's distributed national database.

CONCLUSION

Discovernet© is very much a work in progress. While its attributes of active learning strategies, access, and quality content linked to curriculum objectives have been instrumental in shaping this portal, there will no doubt be modifications and improvements made to Discovernet© over the coming months and years. Hopefully its development and evaluation will add to the growing body of work into education gateways on the web, and appropriate online resources for children in younger age groups who we know are accessing the web both at school and at home on a regular basis.

Postscript: at the time of going to print, Discovernet© is being evaluated and tested in focus groups. This information will be presented at the ichim01 conference as a part of this paper and will be made available on the AMOL web site: http://amol.org.au.

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