

Australian Government

AUSTRALIA'S CHIEF SCIENTIST

VALUE OF LIBRARIES AND INFORMATION SYMPOSIUM

KEYNOTE SPEECH – MORNING SESSION

30 MINUTE SPEECH PLUS 10 MINUTE Q & A

UNIVERSITY HOUSE – ANU

9:00 - 9:40

23 MAY 2012

CHECK AGAINST DELIVERY

Good morning and thank you for inviting me here today, though I almost feel a little nervous speaking in more than a whisper in front of you all.

I have always been a little in awe of librarians and your ability to silence even the most rowdy of students with nothing but a look. During my time as Vice Chancellor at ANU, the librarians were a powerful ally.

Because of this occasion, I have been reflecting on what libraries meant to me back in my youth and what they mean to society today. Growing up in regional Victoria, we used to get our library books delivered to us in a brown paper bag from the Country Lending Service and there was always such household excitement when the packages arrived.

Today, with the internet, Ipads, Kindles, E-readers and the whole E-osphere, accessing information has completely changed which means libraries have evolved as a result. As it was written in a journal about libraries and information science, "A library's status is no longer defined by the collection it housed; it is extended to include online and seamless access to information resources. The right amount of information at the right time has long since been an important factor for all kinds of libraries."¹

It also said that Libraries have been thought of as being expert at collecting and organizing published information. This is certainly true: having libraries and librarians as the custodians of managing and disseminating our information remains very important to me.

I was invited here today in my capacity of Australia's Chief Scientist. Some may think science and librarianship a strange combination but there is much we share in common. Scientists, like librarians, are in the knowledge business. Both of our professions depend on the collection and management of information. Both share a strict process in the way we use that information.

¹ Knowledge management and new generation of libraries information services: A concepts International Journal of Library and Information Science Vol. 1(2) pp. 024-030, March, 2010

And both professions share a responsibility for disseminating and translating that information.

As we move into a knowledge economy in Australia, information maintenance, management and communication become of increasing importance. This is especially true in the science disciplines, as much new knowledge builds on that which has gone before.

The importance of this shift towards a knowledge economy was highlighted in a recent survey that compared high school test results between countries. In countries where a high percentage of their GDP was reliant on natural resources like oil, coal and uranium, results on international tests like NAPLAN were quite low. Where the country had very minimal reliance on natural resources, the results were typically much higher. One of the possible conclusions this study demonstrates is that perhaps in countries where there is no other alternative than to rely on the skill of their workforce, the people are more likely to value knowledge, learning and information.

Australia will not always be able to rely on our natural resources wealth – eventually they will run out. And we need to be prepared for when that happens. To be able to adapt to a fully sufficient knowledge economy that can sustain us. The work of information professionals – librarians, scientists, teachers will be crucial to this adaptation.

Today we are living in an age of information excess. I saw it written the other day that we create as much information in two days now as we did from the dawn of man through 2003². A lot of this is user-generated content on things like facebook, twitter, youtube and tumbler. But it is also the result of science.

Take the Square Kilometre Array telescope, a global collaboration in radioastronomy to be built across Australia, New Zealand and South Africa. As it becomes fully operational in the coming decades, it will generate 10

² http://techcrunch.com/2010/08/04/schmidt-data/

billion gigabytes of data per day³. To put it in perspective, this is about the same amount of information as can be held on a billion smart phones. And what does all this data amount to? A lot of ones and zeroes? No, in the right hands this data translates to knowledge. In the case of the SKA, knowledge addressing age old questions concerning the very beginnings of the universe and the nature of dark matter.

At the same time, the explosion of genetics has given us more data than we know what to do with. Decoding the human genome involves analysing 3 billion base pairs—which took ten years the first time it was done in 2003, but can now be achieved in one week.

What this tells us is that the world contains more data than we will ever be able to touch, and that more data is being created even more rapidly. Clearly, one of the key challenges for science, and society, is how to manage with these large amounts of data. Without the capacity to do so, we will lose the knowledge they contain. This has not gone unnoticed as the Government has just invested a further \$312 million over 3 years into creating Eresearch infrastructure. This will transform research and knowledge on a global scale and certainly puts my days of isolation in the lab in the dark ages. Literally! When I was studying in Oxford we used to have to take our breaks according to when the electricity was down due to the miner's strikes...

Epistemologically speaking, information is made up of a collection of data and knowledge is made up of different strands of information. It may be the job of academic and scientific librarians to archive the data, and it may very well be the task of public and school librarians to find ways to disseminate the knowledge.

The challenge then is to understand what information has *value*, and what does not. Here too I see the crucial role libraries play. For libraries are not just a storage house of information, but a place to build context and understand the world we live in. Like no other institution in society, libraries allow us to take knowledge and ideas and add cultural context. Libraries are a link to the

³ ref http://www.csiro.au/news/ps3ng

past, and the story of who we are and how we got where we are. The value of libraries for the community cannot be understated nor those who work in them. I read the other day that, "The most important resource in the knowledge economy system is the talents who grasp knowledge" and that would be you!

I mentioned earlier that eventually, the world will be dependent on the knowledge economy. To be a strong, global competitor in such an environment, we need a capable, intelligent and skilled workforce. This means starting at the beginning. We need students who are excited by knowledge, who have inquisitive natures and a passion to learn. In order for this to be facilitated, school library management advises that "The evolution of school libraries into flexible, dynamic, high-tech learning centres designed to prepare students as responsible digital citizens to function effectively in a complex information landscape requires leadership and strategic planning."

Librarians can facilitate this: A 2003 study of Australian libraries found that 'a strong library program that is adequately staff, resourced and funded can lead to higher student achievement regardless of the socioeconomic or educational levels of the adults in the community.⁵ We cannot afford to neglect any of the potential any Australia possesses – we need all walks of the Australian population on board. In this capacity, libraries are crucial for a literate Australia.

Speaking as a former Vice Chancellor and research scientist, university libraries are an indispensable resource for students, staff and researchers.

Oosterlink and Leuven (2002) pointed out that, "In our era of knowledge society and a knowledge economy, it is clear that universities have a major role to play". In other words, universities are faced with a challenge to better create and disseminate knowledge to society. However, Reid (2000) argued "traditionally, universities have been the sites of knowledge production,

⁴ http://www.schoollibrarymanagement.com/supporting-knowledge-creation/

⁵ Lonsdale, M 2003, Impact of school libraries on student achievement: a review of the research, report for the Australian School Library Association, ACER, Camberwell, Vic., p. 27.

storage, dissemination and authorisation". The success of academic libraries depends on their ability to utilise information and knowledge of its staff to better serve the needs of the academic community.⁶

I don't think this core principal will ever change and just goes to show the prevalent role that libraries play in our knowledge economy. Sure, libraries have evolved and will continue to do so, I mean thankfully we don't have to hunt through reference cards anymore or file them for that matter, but the students are still using the library for the same purpose that I did, to access knowledge and ideas and (more surreptitiously) to find themselves a date! And I think this will always remain the same, on both counts!

In a digital age, the question may be asked is there a place for books and papers and parchment? Here, science answers an emphatic yes. Not everything can be digitised. As an example, a study was released early last year that contributes to the vast amount of historical data we have on climate change. Scientist's understanding of climate change hinges on the quality and length of historical weather observations, but in large parts of the southern hemisphere, records from observational instruments only cover the last 50-100 years. Fortunately, millions of observations lie buried in the logbooks and diaries of early European voyages, written decades before official meteorological stations were established.

Researchers at the University of Melbourne were lucky enough recently to stumble upon a daily logbook of weather observations including temperature, barometric pressure and winds from the First Fleet's flagship *HMS Sirius*. The researchers found the logbook at the State Library of NSW.

From the logbook they have compared each eighteenth-century temperature and pressure reading against a modern climatology for each day's position, given by the ship's latitude and longitude, providing a unique insight into 18th century weather.

^{6 &}lt;u>http://mapule276883.pbworks.com/f/Knowledge+management+practices+in+academic+libraries.pdf</u>

Although a single record covering a relatively short period of time is insufficient for assessing absolute changes in climate variability, such records are important for providing information of relative variability from a period where limited data are currently available.

And it is not an isolated incident. Anatomical drawings, sketches of flora and fauna and age-old experiments have often been discovered in the safe confines of libraries. It is the skill of librarians to help scientists find it. And according to Google's director of technology, "it will be about 300 years until computers are as good as your local reference library in doing search".

I understand that ALIA is still in the midst of celebrating "information sharing month," important since libraries are also a place for collaboration, and sharing ideas. Collaboration is increasingly important in the sciences. As I mentioned before gone are the days of the lone researcher tinkering in his laboratory late at night. These days, science is conducted by teams of researchers, often working across disciplines. As my office reported in our recently released Health of Australia Science report, almost 50% of scientific papers authored by Australians included a collaborative component. Information is not only (growing), it is also internationalising.

There are a lot of elements contribute to our changing world but this change has all come on the back of information turning into knowledge turning into hard work and we will always need keepers of that information and disseminators of that knowledge. Libraries are the bridge between knowledge and tangible results from that knowledge, certainly from a scientific research point of view. Libraries will continue to play a very crucial role in the extension and modification of knowledge. When you think about your role as information custodians to kindergarten students right through to the workforce and retired, the role of the library is formative in the development of our society and for this, I am very grateful for all of the hard work you do.

Thank you again for inviting me here to speak to you today.