



**Connecting the knowledge networks: reimagining academic libraries to 2020**

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**Abstract:**

*If we were to imagine the academic library of 2020 what might it look like? Have we yet to fully integrate and realise the reformative potential of the digital revolution? What impact will the digital paradigm have on traditional modes and policies relating to scholarly communication, learning, teaching and research for the academic library in 2020?*

*In order to answer some of these questions, some forward thinking opinions are explored relating to learning, teaching and research in academic institutions as well as a futures scenario developed at Lincoln University in New Zealand in 2011. The scenario is called **Connecting the Knowledge Networks: Reimagining Learning, Teaching and Research at Lincoln University to 2020.***

**Introduction**

If we were to imagine the academic library of 2020 what might it look like? Have we yet to fully integrate and realise the reformative potential of the digital revolution? What impact will the digital paradigm have on traditional modes and policies relating to scholarly communication, learning, teaching and research for the academic library in 2020?

In order to answer some of these questions, some forward thinking opinions are explored relating to learning, teaching and research in academic institutions as well as a futures scenario developed at Lincoln University in New Zealand in 2011. The scenario is called **Connecting the Knowledge Networks: Reimagining Learning, Teaching and Research at Lincoln University to 2020.**

In this paper, alternatives for academic libraries in 2020 are developed which suggest that while the digital paradigm offers both unprecedented opportunities and risks for the academic

library of the future, it is the leadership choices we make that will define success. The organisational transformation required to fully leverage the digital paradigm will be as much about fundamental changes to traditional organisational cultures, established modes of scholarship, learning and teaching as about the changes that the digital revolution itself provoked. The extent to which organisations engage with the whole ecology of change will position the academic library of the future as a vibrant intellectual hub at the heart of the learning, teaching and research nexus of a university community. Alternatively, the digital revolution may signal a far less appealing future where the academic library is seen to be less relevant to the success of the organisation and is passed by in favour of alternative forms of delivery.

So how do we facilitate the fundamental changes in thinking in academic organisations to effectively take advantage of the unprecedented opportunities of the digital revolution? After all, futurists, science fiction writers and the like have always made an important contribution by rattling our complacency and challenging us to stretch our thinking into the future to reimagine a range of scenarios and possibilities. As we well know, scholarly communication and scholarship, teaching and learning are grounded in traditions and conventions that are pre-digital, so it would be wrong to presume that this magnitude of change needed in organisations will be straightforward or easy. The digital revolution has delivered a disruptive, transforming paradigm shift so profound in its impact on established norms and practices that we have at times struggled to respond to the present, let alone the future! Those of us who are, at times, understandably weary of change may often question the benefit of too much futures thinking. After all, haven't libraries been at the heart of the knowledge revolution and with this degree of change we may rightly think that the future is now! So how do we in academic libraries throughout the world best respond to the unprecedented opportunity that the digital world represents?

You could argue that we are doing reasonably well. We have drawn from some inspired future thinkers over the years.

Some examples include:

*The Big Bang: Creating the new library universe* (NSLA, 2007), which together with the Reimagining Libraries project (NSLA, 2011), defined an agenda for completely reimagining and reconceptualising the National and State Libraries of Australasia (Australia and New Zealand) to 2011. OCLC has continued to confront us with the future in their broad ranging *Perceptions of Libraries 2010: Content and communities* report (OCLC, 2010) which so ably describes for us the social and economic context in which rapid change is occurring.

Thought leaders such as Jim Gray and his vision of a fourth paradigm as discussed in the *Fourth Paradigm: Data-intensive Scientific Discovery* (Hey, Tansey, & Tolle, 2009). Gray predicted unprecedented changes to the established conventions of research and scholarship in the scholarly communication value chain. He has caused us to think laterally about the role the academic library plays in resolving the complex issues around e-research and the capture, curation and long term preservation of publically funded research data. Sue McKnight recently edited a collection of papers *Envisioning Future Academic Library Services: Initiatives, Ideas and Challenges* (McKnight, 2010) which provides some useful insights into the future academic library in 2020.

With all this mind-stretching activity in futures thinking and the transformative changes we are experiencing in academic institutions, it seems reasonable to ask, do we have a problem?

Why not keep doing what we are already doing, which is to embrace change at an increasingly rapid and, at times, exhausting rate? What is the need to do things differently?

While there is no doubt that academic libraries generally have a good understanding of the transformative potential of aspects of the digital revolution impacting on libraries, there is less evidence that we are taking bold enough steps in adopting a whole system view that incorporates the changing paradigm of scholarship, learning and teaching within academic organisations. It is apparent that there is significant thinking needed before we can see clearly the opportunities, dependencies, interrelationships and connections and ecology of this change within our organisations and within the context of national and global frameworks that the digital revolution has changed so profoundly.

To understand where the real changes and opportunities may present themselves, it is useful to look at the futures scenario the staff and students engaged with at Lincoln University in Christchurch New Zealand. (Lincoln University. Library Teaching and Learning, 2011)

Early in 2011, Lincoln University undertook a futures exercise which involved a whole system approach to reimagining what influence the digital paradigm might have on the learning, teaching and research activities of the university in 2020. This was done in order to provide greater clarity for the organisation in terms of where to focus its strategic activity in both the immediate and long term. The scenario was called *Connecting the Knowledge Networks: Reimagining learning, teaching and research to 2020* (Lincoln University. Library Teaching and Learning, 2011). Networks in the context of the scenario were defined as people networks as well as digital networks, connections and communication systems. In the scenario it was assumed that the digital paradigm would, by 2020, completely transform the organisational culture, its people, and the way they worked, established scholarly conventions and the systems and services which supported these.

In a world which presented opportunity for greater convergence, networking potential and blurring of traditional academic and professional disciplines and practices, the university leaders challenged the organisation to think outside the square and make some choices about the future.

Drawing on futures thinking relating to changing paradigms in learning, teaching and research, and based on the global economic and social context in which New Zealand was operating, the scenario for the future was developed for discussion over a period of two months. Students and staff of the University were then invited to critique the scenario and add their thoughts about the future.

Typical of all futures thinking, the assumptions on which the scenario was based were shared, then challenged and debated. While in many ways these assumptions were for the most part unremarkable, (Lincoln University. Library Teaching and Learning, 2011) they did assume that the digital paradigm would have a significant and lasting impact on the culture of the organisation, and would require a more networked, connected, organisational culture to leverage change in the future. The scenario predicted that “*Better outcomes for our learning, teaching and research activities will be gained by a more joined up approach, drawing aspirations from individual best practice and then sharing and scaling these where appropriate*”. (Lincoln University. Library Teaching and Learning, 2011, Assumption 8)

What is noteworthy here, is that, underpinning the assumption that the digital paradigm will be transformative, sits an equally compelling imperative which assumes that academic culture, established process of scholarly communication and teaching throughout the organisation would need to transform at an equally rapid rate.

So what were some of the transformative issues which were predicted in the scenario? Unsurprisingly, the disruptive influences of the digital paradigm on scholarship, learning and teaching were predicted to be the most powerful agent of change and challenge to established academic conventions. The formal authoritative knowledge systems which once underpinned scholarly communication were assumed to have been destabilised by the rapidly growing informal knowledge systems driven by individuals, the anarchic impact of social networking, and the rapid move to a citizen centric knowledge creation. Leveraging the power of the web to connect, communicate and transform was thought to be fundamental to transforming the nexus of learning, teaching and research in the University.

The role of the academic library in leveraging the rapidly changing paradigms of e-research and e-scholarship and the challenges of curating, storing and preserving publicly funded research data for reuse and reengagement were seen to be key issues. So too were the multiple literacies needed by students and academic staff in order to engage effectively with the rapidly changing world around them.

To illustrate these points, extracts from the scenario are included –

The scenario predicted:

***The academic library as the intellectual commons of the physical and virtual campus***

*By 2020 the Library that never sleeps is the intellectual commons of the physical and virtual campus. Through relevant content and data- rich global networks, Lincoln University students and staff are connected to information sources from all parts of the world. Importantly, the research and scholarship produced by Lincoln University researchers, scholars and student, are now much more widely accessible throughout New Zealand and the rest of the world than ever before.*

*Lincoln University has built an enviable reputation for its innovative, high quality learning and teaching environments. It was a smart move we took in 2011 to take a much more “joined up” approach to the research, learning and teaching activities of the University. Fostering a more integrated culture across the organisation we leveraged the very best teaching and learning innovation as well as the new ideas and knowledge produced by our staff and students.” (Lincoln University. Library Teaching and Learning, 2011 , Section 1)*

The web, and the growing range of applications (apps) was seen to be a powerful agent of change in academic libraries.

The scenario predicted:

***The power of the Web to connect and communicate***

*“The success of our students and the growing reputation of Lincoln as a place of choice for scholars and students throughout the world, has been strongly linked with our decision to be more intentional and strategic about our web presence. While we were quick to seize the opportunities and reach of the social networking capability of web 2.0 we also employed*

*people who could guide us in realising the importance and the opportunities presented by web 3.0 and beyond. Our growing understanding of the intelligent and semantic web has meant Lincoln University engages with its students and with global research communities in a much more personalised and transparent way. The majority of our intellectual output is now open access with the New Zealand Creative Commons licences indicating how we wish Lincoln's intellectual output to be attributed. Our teaching delivery has leveraged the web effectively and our "on the farm" knowledge transfer is now relayed through the ubiquitous, "all you can eat" broadband to all parts of the country and via national global and national networks. The Lincoln story is told with passion and enthusiasm by our staff and alumni, and other communities of interest. Ironically, it didn't cost too much to do this. All that had changed was that we had begun to understand the extraordinary power of the web as an avenue to connect and communicate."(Lincoln University. Library Teaching and Learning, 2011 , Section 7)*

A move away from siloed, disconnected organisations towards a more holistic joined up approach to connecting digital content and systems and the intellectual output of the university was seen to be important. Achieving this scale of systems interoperability also assumes that, by taking a less rigid approach to established organisational structures and conventions, costly duplication of effort will be avoided.

The scenario predicted:

***Taking a whole systems view avoids costly duplication***

*Underpinning all of Lincoln University's advances has been a strong commitment to staying at the leading edge of knowledge systems. By taking a whole systems approach to our digital assets (both content and data) as well as to the technology infrastructure that supports these, we avoided costly duplication of effort. This meant we gained better value from our investment in knowledge systems and technology. By mapping content needs across teaching and research programmes, we have a responsive Digital Content Strategy that provides the framework for access to information and preservation of core content and data. Students and staff now have high speed finger- tip access to the data and content they need to support their learning, teaching and research requirements. (Lincoln University. Library Teaching and Learning, 2011 , Section 8)*

The issue of long term access to research data and the information from data intensive research described by Jim Gray in the Fourth Paradigm was seen to be one of the most compelling transforming issues of the academic library in 2020.

The scenario predicted that Lincoln University would be a: ***Leader in the management and curation of research data. Unique research data and information is not lost***

*The biggest change of all is that Lincoln University has taken an active role in leveraging the benefits of a changing paradigm in research through the national e-research Framework. The evolving digital environment has provided us with an opportunity to remodel the way we carry out research and prompted us to engage in a new national leadership role, ensuring that research data and information is actively disseminated and made accessible globally. Lincoln's research contribution is now even more widely respected and is a vital component of New Zealand's land based economy. Our success is reflected through increased research funding and a growing international reputation for the expertise we have in managing, curating and securing perpetual access to the raw data on which our research outcomes are*

based.

*While the economic benefits of our interaction with research data have been recognised, there are also clear social, ethical and moral incentives for constructing an environment where data can be procured to create new knowledge and generate new ideas. We have a responsibility to openly share new publically funded knowledge, unless there is a strong ethical or commercial reason to suppress this information. (Lincoln University. Library Teaching and Learning, 2011 , Section 11)*

In most parts of the world, the important issue of long term management, curation and preservation of research data for the purpose of reuse is not yet uniformly seen as a part of an academic library's core services in 2011. Engagement with this complex issue may present both an opportunity and a risk for academic libraries in the future. While the core skills of information management that are fundamental to the long term organisation of knowledge are familiar to library professionals, we are seeing a tendency of academic libraries internationally to step back from engaging with management and the curation of research data. A more useful approach may be to take a more joined up approach across an organisation which draws on a range of expertise. The issues are too complex and expensive for any one part of an organisation to act alone. The experts from the academic library will be key players and in this regard we can confidently assume that by 2020 the "mash up" generation we are all part of will demand free access to publically funded research data so that it can be engaged with and repurposed for the production of new thought and knowledge creation. National data and information networks and services are emerging throughout the world. We should therefore see the long term management of research data as an opportunity rather than a threat in the future.

While academic libraries have in the past been proactive in supporting students and staff to be information literate and fluent in accessing and analysing information, by 2020 there are predictions that there will be multiple literacies to be embraced. Data literacy is one such area.

The scenario predicted

### ***Our people have the multiple literacies to be successful***

*The changes in 2011 had a positive impact on learning and teaching at the University. We draw inspiration from our finest teaching to understand more about where, when and how students learn best. Learning and teaching at Lincoln is student centred, research inspired, aligned to graduate profiles, based on real life interdisciplinary context, and authentically assessed. There is now tangible evidence of our growing reputation in innovative and engaging teaching, drawn from an active and current research base, supported by industry partnerships. Importantly we have assisted in the ongoing development of all of our staff. We have worked hard as an organisation to understand what an academic needs to be successful in their teaching or research endeavours. There is now a sophisticated understanding of the skills and training needed for staff and students to be successful practitioners in the digital age.(Lincoln University. Library Teaching and Learning, 2011 , Section 2)*

*Core to the Lincoln learning culture is a commitment to ensure that our people have the multiple literacies and skills needed to maximise the current trends in learning, teaching and*

research. Data, information and visual literacies are an embedded part of student learning outcomes and staff development. Research and writing skills are an integrated part of student learning outcomes and staff development. Research literacies are regarded as particularly important in 2020, so Lincoln has developed a culture in which research is central and fundamental from the moment students begin their studies. This adds to the reputation of Lincoln's people as smart, industry savvy, innovative and ready for the real world. There is tangible practical support for staff and students in emerging technologies and core software packages. Lincoln students and staff have a reputation for being fluent and confident in the application and use of relevant technologies. (Lincoln University. *Library Teaching and Learning*, 2011 , Section 3)

### **Concluding comments**

Paradoxically, while the scenario presented offered a view of the future, which if accepted, would signal significant and disruptive change to the organisation, it was the process of engagement with the scenario where we expected the real cultural change in the organisation would occur. It was assumed that a collaborative, empowered voice, which fostered inclusive conversation across the organisation and which connected the perspectives of the scholar, learner, teacher and services would be a powerful enabler and agent for change. It was assumed that strong individual engagement with the scenario would encourage a sense of community and involvement and deliver a shared vision. From this we knew that a critical factor underpinning the success of a futures exercise which attempts to reimagine the academic library in 2020 is the need to take a whole systems view of the process. This involves having a sophisticated understanding of the social, political and economic context in which change occurs as well as an understanding of the complex nature of people, change and organisational cultures, as well as the traditions and conventions which are held to be so important by individuals.

By connecting the knowledge networks described in the paper which draw on both the inspiration, ideas and imagination of people, as well as from the connecting, interactive, personalised, creative potential of the digital paradigm we have reason to feel confident that academic libraries in 2020 will continue to be the intellectual commons of the physical and virtual campuses in the future, and powerful catalysts of change in our organisations.

### **References**

- Hey, T., Tansey, S., & Tolle, K. (Eds.). (2009). *The Fourth Paradigm : Data-intensive scientific discovery*. Redmond: Microsoft Research. Retrieved from [http://research.microsoft.com/en-us/collaboration/fourthparadigm/4th\\_paradigm\\_book\\_complete\\_lr.pdf](http://research.microsoft.com/en-us/collaboration/fourthparadigm/4th_paradigm_book_complete_lr.pdf)
- Lincoln University. Library Teaching and Learning. (2011). *Connecting the Knowledge Networks: Reimagining learning, teaching and research at Lincoln University to 2020*. Retrieved from <http://library.lincoln.ac.nz/Documents/Library/Connecting-the-Knowledge-Networks.pdf>
- McKnight, S. (Ed.). (2010). *Envisioning Future Academic Library Services: Initiatives, Ideas and Challenges*. London: Facet Publishing.
- NSLA. (2007). *The Big Bang: Creating the new library universe*. Retrieved 26 May 2011, from <http://www.nsla.org.au/publications/papers/2007/pdf/NSLA.Discussion-Paper-20070629-The.Big.Bang..creating.the.new.library.universe.pdf>

NSLA. (2011). *Re-imagining libraries*. Retrieved from

<http://www.nsla.org.au/projects/rls/newsletter>

OCLC. (2010). *Perceptions of libraries, 2010: Context and community*. Retrieved 26 May

2011, from [http://www.oclc.org/reports/2010perceptions/2010perceptions\\_all.pdf](http://www.oclc.org/reports/2010perceptions/2010perceptions_all.pdf)

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