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# Libraries: the warm-ware between the hardware and software of the digital world

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Digital resources are becoming more accessible as university students and academics are increasingly working off campus and online. Doctors and specialists who travel to multiple hospitals and clinics also require quick and easy access to these online resources. What role do university and hospital libraries play in providing the digital tools that allow people to work and study from home, and across multiple hospitals and campuses?

Daniel McDonald, Librarian at Queensland's Darling Downs Health and editor of [Journal of Health Information and Libraries Australasia](#), says libraries are always pushing the boundaries and incorporating technology in the service of people.

"Libraries, especially in health and health science, are almost always at the forefront of technological adoptions and adaptations. It's possible that the most used healthcare tool in the world daily is not a drug or a scalpel, but PubMed."

Mr McDonald says the challenges of libraries in a digital world are the same challenges they have always sought to address:

- How can we make information work for people?
- How can we remove barriers to access for information?
- How can we describe and collate information in a coherent manner that makes it retrievable, and meaningful?
- How can we find the time and money to do all the things we know will work and make digital information better, if only we had the resources to invest?

"A colleague once described libraries as the warm-ware that sits between the hardware and software of the digital world," he said.

"We make online information make sense for people. We show them how to use Zoom and Teams. We participate in rapidly produced systematic reviews, and dynamic systematic reviews. We advocate hard for greater openness and sharing in scholarly communication.

"We privilege evidence, and filter out the flim-flam, and ensure high-quality scholarly communication is placed in the service of those making complex clinical decisions."

*"There is often a sense that libraries are forever battling modernity, constantly having to justify their relevance and prove their worth in a world where all information is always available, everywhere. The reality is very different. Libraries don't shoosh, and they don't move into the digital world. They are already in the digital world. They have been from the beginning," Mr McDonald said.*

## HOW DIGITAL LIBRARIES EXTEND THEIR REACH

Mr McDonald says libraries must have a nuanced and context-specific understanding of their users, and potential users, and tailor their services accordingly.

“Where the context suits, by all means invest in digital content. Just make sure that it’s actually what users want, and that it’s working for them.”




According to Mr McDonald, the benefits of a digital library are:

- Distribution across a disparate network, eg geographically remote or dislocated workforce.
- Rapid use, reuse and re-format, eg incorporation into Endnote, learning management platforms, electronic health records and decision support, discovery engines and cross-platform retrieval.
- Attractive to administrators: large bundles of dynamic content can be purchased and deployed, with an assumption that once deployed all users can/will access it.

- Large parts of people’s professional and personal lives are conducted digitally, as are organisational programs and processes. Providing content that suits this workflow is sensible and necessary.
- Scalability: Digital content can expand usage and ways of using it at levels that far exceed those of print content.
- Reportability: digital content delivery enables insights into user groups, resource needs, access and download patterns, and ultimately a better view of use and engagement with library resources.

## TECHNOLOGY DEVELOPMENTS IMPACTING LIBRARIES

NMC’s Horizon Report: [2017 Library Edition](#) identified the following key trends, challenges and developments in technology that would impact libraries:

KEY TRENDS	SIGNIFICANT CHALLENGES	IMPORTANT DEVELOPMENTS IN TECHNOLOGY
		
Advancing cultures of innovation	Addressing societal challenges	Adaptive learning technologies
Collaborative learning approaches	Competition from alternative avenues of discovery	Information visualization
Increasing accessibility of research content	Embedding academic and research libraries in the curriculum	Makerspaces
Prioritization of mobile content and delivery	Managing knowledge obsolescence	Mixed reality
Proliferation of open educational resources	Marketing/promoting library services	Virtual assistants
Shift away from books	Rethinking the roles and skills of librarians	Wearable technology

Source: Adams Becker, S., Cummins, M., Davis, A., Freeman, A., Giesinger Hall, C., Ananthanarayanan, V., Langley, K., and Wolfson, N. (2017). NMC Horizon Report: 2017 Library Edition. Austin, Texas: The New Media Consortium.

The NMC report highlights these top 10 themes of organizational change that underpin the above topics:

1. Libraries remain the gatekeepers to rich tapestries of information and knowledge.
2. Libraries must keep pace with evolving formats for storing and publishing data, scholarly records, and publications to match larger societal consumption trends favoring video, visualizations, virtual reality, and more.
3. In the face of financial constraints, open access is a potential solution.
4. Spreading digital fluency is a core responsibility.
5. Enabled by digital scholarship technologies, the research landscape is evolving. GIS data, data visualization, and big data are expanding how information is collected and shared. These tools are helping libraries preserve and mine their collections while illuminating collaborative opportunities.
6. Artificial intelligence and the Internet of Things are poised to amplify the utility and reach of library services.

## THE FUTURE OF UNIVERSITY LIBRARIES

- The COVID-19 pandemic is expected to [“cause a rethinking of academic instruction, innovations in online learning, and a renewed appreciation for resources”](#).
- Increased use and reliance on [digital collections, self-service and online programming](#).
- Students have more [convenient access to online resources](#) at lower costs.
- Singapore Management University Libraries Strategic Plan 2021-2025 identifies [digital transformation](#) as a key priority.
- The [China Digital Library](#) is a knowledge service platform offering online reading and offline borrowing of Chinese ebooks, newspapers, images and historical publications.

## WHY PRINTED RESOURCES ARE STILL RELEVANT

Mr McDonald says most hospital-based libraries have moved to online-only or at least online-dominant collection and delivery for journal content.

“This makes sense due to the volume and rapidity of journal publishing, combined with the fluid nature of articles as they move from pre-print to online-first to formal issue allocation, table of contents alerts, indexed databases and individual Endnote libraries.

“Any users still accessing printed journals tend to be members of colleges or professional associations who receive a printed journal as part of their membership.”

Mr McDonald says printed resources continue to be used because:

- Print still works as a learning object. The geography of a page works for our brain, often much more effectively than the scroll of a screen.

“Readers still like printed books, not out of nostalgia, but because they work. They are not back-lit, tiring the eyes; they do not require power; they do not require authentication; they can present complex interactions of disparate forms of information in an elegant way (eg table, figures, text, call-out box plus illustration all on the one page); they are portable in ways that online resources often are not.”

- Hospitals have staff with variable digital literacy skills, access to devices, and confidence.

“Some staff never see a computer during their working day. Some see a computer, but could never hope to access it, given their scarcity and demand. Some staff don’t maintain their basic usernames and passwords, while others have had difficult experiences with online payroll and human resources, medical records and corporate learning systems, and want as little as possible to do with computers. Assuming an online information resource is preferable, or even accessible, for them is unwise, and unfair.”

- E-books are often more expensive than their print counterparts.

“Usage is likely to be much lower than in a large academic cohort, and so the economics of an online-only collection don’t stack up.”

- Authentication in hospital settings can be a real problem.

“Often, lots of different systems are bolted on to a health service, and they all have their own slightly different methods for authentication. Staff end up with dozens of usernames and passwords, all with different requirements and resetting at different times. This can be a substantial barrier to online resource use.”

## DELIVERING HYBRID LEARNING ENVIRONMENTS

“Online resources, especially books, still have a role to play and are used, sometimes heavily, in hospital settings,” Mr McDonald said.

“Some hospital libraries use them as a reference collection, while others have integrated them into local learning modules and education courses. Some health services are geographically disparate and online-only is the best method of delivering content.

“However, I am sure that print will still play a significant role for quite some time, and it is important to view this hybrid environment in a nuanced way. Libraries worth their salt put their users at the centre of all that they do, and tailor their services accordingly. This includes what mix of formats make up their collections and access points,” he said.

Mr McDonald also believes some digital tools will likely become standard practice, such as the point-of-care tool UpToDate, which he says “is used up to 1000 times a week in our health service, to the point where I would conclude it is a standard information tool for many practitioners”.

“However, the registrar who uses the UpToDate app, electronic Therapeutic Guidelines (eTG) on a website, does the literature review for their college research project using Medline and Endnote, retrieves articles from online journal content and copy/pastes quotes into a manuscript, is the same registrar who prints those articles to highlight, annotate and scrawl over.

“That registrar also uses printed textbooks to study for their final college exams because it’s so much easier to visualize the insertion of airway support, the anatomy of the trachea and physiology of the respiratory system, and show a study buddy what page 454 says.”

*“Society is transformed through the power of research, teaching and learning, all of which occur in a digital context. University libraries are instrumental in building society’s capacity for digital dexterity, transforming how people experience knowledge through discovery, use and sharing.”*

[Council of Australian University Librarians position statement on digital dexterity](#)

## ADDITIONAL TOOLS THAT SUPPORT RESEARCH

### Ovid Discovery

[Search and browse](#)

100+ million biomedical resources

### eJP dual access

Explore ways to integrate to full text from multiple sites

### eTOC alerts

[Stay informed](#) about the latest news, revisions and product information

### Ovid metrics

Features the [most read articles](#) around the world

### Ovid Discovery Link Resolver

A comprehensive [linking solution](#) to display your organisation’s full-text links

### Knowledge base

[Find solutions](#) easily and ask questions about the Ovid platform

### New reading experience

- Citation, linking and PDF access.
- Related articles suggested for additional reading

### UpToDate integration

- Link directly to full-text articles in Ovid journals
- Link to UpToDate from Ovid full-text articles and database citations

## A ONE-STOP ONLINE SOLUTION FOR LIBRARIES

Many best practice solutions are now being published in videos, reports, blogs, audio recordings and systematic reviews in addition to traditional scientific, medical, and healthcare journals and books.

Having access to these multiple online resources through a single integrated solution provides a cost-effective and efficient tool that improves research productivity for students, academics and health practitioners.

Ovid's [online research solution](#) is a comprehensive tool that provides quick and easy access to thousands of full-text journal articles, eBooks, and database resources:

- [Lippincott journals](#) from leading medical and research societies, including the American Society of Clinical Oncology and its flagship *Journal of Clinical Oncology*, American Heart Association, and American Academy of Neurology, the world's largest professional association of neurologists.
- Core and niche scientific, medical, and healthcare disciplines, including medicine, nursing and health professions, behavioral sciences, basic sciences, humanities and technologies, agriculture and food sciences, engineering.
- Indexed and non-indexed resources from publishers, information providers, and aggregators.
- Searchable content from [journal](#) articles, books, videos, images, reports, procedures, blogs, audio recordings, systematic reviews.
- Links to key controlled vocabulary, definitions from Stedman's Medical Dictionary, and related terms from the Unified Medical Language System (UMLS) to help create a comprehensive search strategy for systematic reviews.