Supporting Research Through Partnership

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Introduction

We live in a world where disruptive technological change is transforming the world into a genuine global economy. The rise of Asia and the global financial crisis show not only how profound these changes can be, but also how globally connected we are. Commoditization of mobile technologies, ubiquitousness of the Internet and social media, and the rise of cloud services are challenging every industry, every profession, and every organization to reconsider long-held understandings. Almost everything is now globally tradable – knowledge, goods, services, skills and capability (Business Council of Australia, 2014, p. 3). Technology is enabling entirely new business models which can rapidly evolve to challenge established players. Schroeder (2014) describes it as a post-enterprise world, where market focus is on the consumer and on “above” the enterprise in highly-scalable, multi-enterprise solutions.

The knowledge industry has been, and will be further, deeply impacted by these changes. The impact of digital media and the Internet on research and higher education is manifest through the rise of global competition and ranking schemes, the perturbations caused by the advent of MOOCs, the emergence of “data-led” research practice, the increased pressure from government to maximize the return on their investment in research, and changing publisher business models. As Finnemann (2012, p. 202) notes, “... the historical dynamic has reached a point where all institutions concerned with knowledge handling will have to redefine themselves.” Research libraries are no exception. “The ... library community, feeling the impact of technological progress, economic pressures, and social and political disruption, has spent the
last decade thrashing about, seeking a refreshed purpose and new ways to demonstrate and create value and impact.” (Neal, 2014, p. 612).

In a hyper-connected world the emphasis is shifting from provider-consumer relationships to co-creation, collaboration and partnerships, from service provider to collaborative partner (ARL, 2014, p. 2), from “product to … process” (Lougee, 2002, p. 4). The imperative is for organizations, indeed for professions, to reinterpret and reinvent themselves through the lens of emergent business and technological possibilities.

This chapter explores how disruptive change is creating emergent business models increasingly premised upon collaboration and partnership, as evidenced in the repositioning of research libraries in the support of research. It will discuss how academic research libraries are becoming partners in the research process, building upon core capabilities, to create value and impact.

**Disruptive technological change**

In his book “The Innovator’s Dilemma,” Christensen (1997) uses the term “disruptive innovation” to describe a process by which a product or service is introduced at the bottom of a market and ultimately displaces established competitors. Based on the changing application of technology in the marketplace, he cites such notable examples as the mobile phone, digital photography, and online retailing. Christensen’s theory has been expanded to apply more broadly to technologies that have introduced radically-different behaviors into society. Rapid technological advances provide the tools with which to disrupt the market and create threats to established market players.
The Internet has created profound change in the innovation landscape, and the ways in which enterprises must operate to remain valued and valuable. Traditional business models are extremely vulnerable, with media-based industries at the forefront of the disruptive changes, and knowledge industries predicted to be most impacted in the coming decade (Economist Intelligence Unit, 2006; Dutta & Bilbao-Ossario, 2012). Consumerization of technologies has put the power into the hands of those who consume a service, allowing them to not only connect directly to content and service creators, but also to be a co-creator. It allows organizations to leverage their strengths by moving from “vertical” to “virtual” integration, given the ease with which they can partner (Trimi et al., 2009), what Martínez-Jerez (2014) describes as “adaptive strategic partnerships.” Strategic alliances are better suited to dealing with a turbulent environment, providing more rapid access to knowledge and capability and greater flexibility. Companies can focus on core competencies, narrow and deepen their capability, and leverage inter-organizational relationships to gain and sustain competitive advantage. Recent advances in cloud computing have served to further accelerate these changes.

Cloud computing is “an information technology service model where computing services (both hardware and software) are delivered on-demand to customers over a network in a self-service fashion, independent of device and location. The resources required to provide the requisite quality-of-service levels are shared, dynamically-scalable, rapidly-provisioned, virtualized and released with minimal service provider interaction” (Martson et al., 2010, p. 177). Cloud computing has the potential to be one of the most disruptive technologies over the next decade (Hancock, 2014; Gartner, 2013). It disrupts the roles of traditional stakeholders in the value chain and creates new roles. IT barriers to innovation are lowered and access to expertise through collaboration is enhanced (Martson et al., 2010).
Over the next three years, Gartner predicts a shift to personal clouds and to hybrid cloud and IT service models. Consumers will worry less about devices and more about services, expecting to access everything they need from any device, anywhere, at any time. Personal and external cloud services will be combined to provide a rich integrated model, totally reliant upon collaboration, shared services, and interoperability. The cloud is being driven by an ecosystem of participants, with self-empowered consumers and businesses taking the lead. Cloud services are being used to drive speed to market, agility, scalability, flexibility, and cost reduction, operating in a “boundary-less” way as businesses look to disintermediate their traditional value chains, focus on core competencies, and outsource non-core services through the cloud and thus drive competitive advantage (North Bridge, 2014, p. 1; Martson et al., 2010).

**Partnering for competitive advantage**

A partnering relationship can range from the more informal personal relationship built on mutual respect and trust to formalized contractual agreements. Within this chapter the work “partnership” includes:

- a personal and professional relationship in an area of common interest built on trust, mutual respect, mutual benefit, and shared purpose
- a strategic partnership and MOUs
- venture partnerships; shareholder relationships; and
- commercial partnerships built on formal negotiated agreement for services delivered.

In a global economy being disrupted by technological innovation, partnerships provide a key strategy to drive competitive advantage. Organizations are seeking partners that can bring technological advantage and/or knowledge and skills acquisition, with reputation being a highly
important criterion when choosing a partner (Trimi et al, 2009; Giesecke, 2014). Partnerships can drive innovation (improved product/reduced cost) through the sharing of expertise, capability, capacity and/or resources, or by challenging existing business approaches; or they may improve market positioning by improving supply or demand, increasing agility and speed to market, and/or enhancing political gain or prestige.

In examining how companies should take a proactive approach to strategic management in the knowledge economy, von Krogh et al (2001) have developed a framework based on four key strategies. A company can leverage its existing knowledge, expand further its knowledge based on existing expertise, appropriate knowledge from partners and other organizations, and develop completely new expertise. Knowledge transfer with external partners is achieved through strategic partnerships. A specific example is given of Unilever actively developing partnerships and alliances with academia.

Martínez-Jerez (2014) refers to “adaptive strategic partnerships” to describe the new ways in which companies are collaborating effectively in a rapidly-changing business environment. These partnerships are formed around bodies of work where you would normally predict vertical integration and founded on more open information exchange, more flexible contracts, and encouraging incentive systems that support innovation and partnership success, with each partner getting a larger share of overall value.

Successful partnerships can be characterized by relationships in which partners each (Mohr & Spekman, 1994; Martínez-Jerez, 2014; Giesecke, 2012):

- bring value and strength to the alliance
- share compatible goals or common purpose
- strive for mutual benefit
• jointly create processes that promote learning, innovation, coordination, commitment, trust, open communication, participation, adaptability, joint planning and problem solving.

In addition, partners must dedicate energies to “the formation and implementation of management strategies that promote and encourage the continued growth and maintenance of the partnership” (Mohr & Spekman, 1994, p. 148). Relationships need to be nurtured so as to create and strengthen mutually beneficial partnerships.

We now explore how the process of knowledge creation and dissemination, and hence the role of research libraries, is being disrupted and why partnerships are paramount to the future success of research libraries if they are to provide value an impact.

**Disruption to knowledge creation and dissemination**

The process of knowledge creation and dissemination has been fundamentally altered by the rise of the Internet. This is having a profound impact on the practice of university research. According to Nonaka et al (2002), knowledge creation is about continuous transfer, combination, and conversion of the different types of knowledge as users practice, interact, and learn. It lies somewhere “between order and chaos” (p. 28). Information technology now offers a virtual collaborative environment to help foster a continuous and dynamic knowledge-creating process; however, it is not only the creation of knowledge but also the actual concept of knowledge itself which is changing and thereby the nature of its relationship to scholarship.

As with scholarship, “... knowledge is perpetually in motion. Today, what we call ‘knowledge’ is constantly being questioned, challenged, rethought, and rewritten” (Edwards et al, 2013, p. 5). Whereas traditional knowledge has been thought of as “a paper, a product,
property,” it can now be thought of as “a network, an infrastructure” (Wilbanks, 2007). New knowledge structures are blurring the distinction between knowledge creators and knowledge consumers. New possibilities for analysis and presentation are leading to innovative types of digital scholarship, which will contribute to research inputs for our scholars. Digital scholarship is pivotal for its ability to produce discipline-based scholarship created with digital tools and presented in a digital form which transcends the current monographic format.

In their study of online communities, Blakey et al (2013) have examined how knowledge production has become increasingly interdisciplinary, multidisciplinary and transdisciplinary. As a result, it is characterized not only by more collaboration and communication but also by more diverse and informal ways of communication. The latter encompasses blogs, wikis, various social media, and online communities (OC). The authors, in analyzing the use of Yammer in two different instances at Griffith University, have cited one of the benefits of this technology as “increased academic fellowship along with increased collaborative and cross disciplinary research opportunities” (p. 4).

Similarly, the role of wiki technology in collaborative knowledge creation has been explored in depth by Prasarnphanich and Wagner (2009). They particularly focus on Wikipedia, which “demonstrates the feasibility and success of this form of collaborative knowledge creation (in a broad sense) within self-organizing, open access community” (p. 33). The successful use of wikis in corporations for knowledge management has been chronicled by Meloche et al. (2009).

Such technologies have deepened opportunities for citizen science which, as the term suggests, involves the participation of the wider community in scientific projects. Also known as Public Participation in Scientific Research (PPRS), this field of practice is growing in popularity as a method of research. It yields new knowledge by providing access to more and different
observations and data than traditional science research, and is especially useful when data needs to be gathered or processed over long periods of time and/or wide geographic areas (Bonney et al, 2009, p. 15). According to the Cornell Lab of Ornithology, in recent years in excess of one hundred articles have been published in peer-reviewed scientific literature that analyze and draw significant conclusions from volunteer-collected data (Cornell Lab, 2014). At the Barbara Hardy Institute, University of South Australia, public citizens have contributed information on projects involving local koala population, beach artifacts, spiders, magpies, possums, and blue tongued lizards.

**Changing nature of university research**

The rapid development and dissemination of digital technologies have helped to enable interdisciplinary research, not just in big science but also in the fast growing field of digital humanities. Partnerships are increasingly essential in the world of research, to share expensive facilities and to work across disciplinary boundaries to solve ‘wicked’ problems such as climate change and population health issues. Electronic networks are making it much easier for investigators from different fields to communicate and collaborate. These rapid changes are pointing toward a very different model of research practice. In the future, it appears that research will become much more open, distributed, and collaborative as it responds to even more complex problems.

According to the American Association for the Advancement of Science (Derrick et al., 2011, p. 2), the “need to accelerate the adoption of interdisciplinary approaches is even more compelling in an era with increasingly complex problems, vast data sets, and powerful research tools. Many of the most interesting and important problems in science can be answered only
through collaborative efforts. The increasing complexity of science demands that concepts and methods from different disciplines be merged.”

In the area of the humanities and social sciences, the Arts and Humanities Research Council (AHRC) in the UK regards itself as playing a greater advocacy and leadership role based in part on the view that “there will be greater need to bring arts and humanities researchers together to influence the context in which they work; to build consortia, cross-disciplinary networks and multi-funder partnerships; and to support individual researchers to forge stronger relationships with academics overseas” (2009, p. 8).

Universities are operating in an increasingly global, competitive environment at a time when collaboration and partnerships are critical to success. World university rankings proliferate as a measure of prestige, in large part influenced by measures of citation impact (Shin and Toutkoushian, 2011). This continues to fuel pressure to publish in highly-ranked journals sustaining the “publish or perish” paradigm. Yet in a world where knowledge—and its application—are seen as a key to global competitiveness, where national prosperity is viewed as underpinned by knowledge innovation, there is growing pressure to make the outputs of publicly-funded research openly accessible. Fundamental to innovation is the dissemination of research findings (Bowen and Graham, 2013; Chesbrough et al., 2006). The Business Council of Australia (2014, p. 6) asserts that “... governments should be enabling innovation across the whole economy by fostering entrepreneurship and collaboration and thus dynamic growth and facilitating skills and capabilities.” They suggest that a key building block in a proposed “innovation infrastructure” would be the alignment of Australia’s research and development efforts with its competitive advantages and the fostering of cross-sector collaboration.
Universities and research organizations are seen as important collaborators with industry and government.

Locking research findings in journals only read by other academics, while fostering further research and increasing citation impact, may do little to optimize the economic return on publicly-funded research. The challenge is appropriately balancing the demand for improved global research rankings with the imperative to ensure research achieves social, economic, and cultural dividends.

Research outputs are no longer regarded as publications resulting from research. There is also a shift to better manage ever-increasing volumes of research data and to regard data as a first class output of research (O’Brien & Simons, 2013). Internationally and nationally, the view is that libraries will play a key role in data access and management, particularly in relation to the vast quantities of data currently being created, and in helping researchers to manage and sift through that data (Christensen-Dalsgaard et al., 2012).

Publisher changing business models

Digital content has disrupted the former relationships and roles among writers, publishers, and readers (Disabato, 2012). The traditional scholarly communication model relied upon researchers generating scholarly content, which they copyright-assigned to publishers, who arranged peer review, editing, and publication, and which the publishers then sold back to libraries at ever increasing prices so that libraries could provide access to the material for their scholars. The Internet has enabled new models of scholarly communication, linking scholars directly with other scholars and students, and creating digital content even if in a high-ranking published journal which does not sit on a library’s shelves. New publishing and pricing models
are being explored for journals, scholarly monographs, textbooks, and digital materials, as stakeholders try to establish sustainable business models.

Some would argue that copyright law is no longer appropriate for a digital world where simply viewing a work is an act of copying. Developments include open access to historical content, author-funded open access to new content, and uncertainty of the future of “Big Deals,” i.e. agreements or subscriptions with the large, usually expensive, publishers and use of contracts to circumvent copyright legislation.

The Internet allows individual scholars and publishers to “deal direct” on the provision of scholarly resources, bypassing the library. As funding agencies and universities enact open access (OA) mandates and publishers transition their journals from the site-license model to the gold OA model, the publishers' core business will become developing relationships with scholars, not librarians. For publishers, it makes perfect sense to cater to scholars both as authors and readers.

In this disrupted research and publishing environment, how are libraries ensuring they continue to create value and impact in their support of research, rather than being one of the organizations that fail to grasp the opportunity?

**Research libraries - creating value and impact**

As John Seeley Brown notes “The challenges we face are both fundamental and substantial. We have moved from an era of equilibrium to a new normal, an era of constant disequilibrium. Our ways of working, ways of creating value, and ways of innovating must be reframed” (Neal, 2014, p. 613).
The traditional value of a research library was often measured by the quality of its collections, and the ability of the librarian to locate and supply relevant works that were not within the collections. While librarians played a role in research, it was predominantly as collector, curator, and service provider. In a world where Google is now often the scholar’s search tool of choice (Williams & Pryor, 2009; Haglund & Olsson, 2008), where the “library collection” is no longer owned by us or on our shelves, our value proposition must be reframed. In future, collections—as we currently know them—will not exist in the same way. The focus instead will be on enhancing discoverability of “smart content,” content which is semantically and richly linked and actionable, no matter where it is located (Shen, 2008). Static information products and services will have been replaced by dynamic service platforms to cater for changing ways in the consumption of information. Consumption is no longer just an object of discovery and analysis, but rather a user-driven action leading to innovation and development. Whither the librarian?

Core capabilities

While collaboration has long been at the heart of what libraries are about (Gaetz, 2009, p. 1), it has been bounded within the more traditional notion of the library as a collection and a service provider. This capability, however, positions us well to develop partnerships. If we are to deliver value and impact in an environment of disruptive innovation we must seek out strategic adaptive partnerships, but in order to do so we must first understand the core capabilities that we bring to any partnership, those that transcend technological innovation and which add value. These provide the foundation for entering a partnership of mutual benefit. It is premised that the core librarian capabilities that can be leveraged in a digitally-disrupted global knowledge environment are:
1. Knowledge of information management theory
   • from creation to destruction or preservation
   • from discoverability to rights and ethics management, and
   • from critical evaluation to analysis and communication.

2. Demonstrated
   • structured thinking
   • innate curiosity, self-directed learning, evidence-based practice
   • proactive collaboration (previously confined predominantly to library-to-library collaboration to deliver public value)
   • ability to communicate, connect, translate, and be an honest broker (see for example Sandhu, 2013, p. 29, who describes the academic library as a “trusted partner for knowledge creation and dissemination”)

3. Valuing access to knowledge for all.

   With the above capabilities, librarians are well positioned to be partners in knowledge creation and dissemination – partners in the process of research. But this requires a reframing of our more traditional role as service provider to a more proactive role as partner, both within and outside our universities.

   If we consider the characteristics of successful partnerships, it is clear that librarians can:
   • *bring value and strength* to the process of knowledge creation and dissemination
   • *share compatible goals or common purpose* with those of their researchers, the universities and the national public and private bodies concerned with leveraging value from research investment
• *strive for mutual benefit* of the partners, given their valuing of access to knowledge for all

• and can *jointly create processes that promote learning, innovation, coordination, commitment, trust, open communication, participation, adaptability, joint planning, and problem solving* given their credentials as collaborators, communicators, and honest brokers.

This aspirational role for librarians was affirmed at the May 2014 ARL membership meeting (Association of Research Libraries, 2014) which described the research library and university of 2033 as “a rich and diverse learning/research ecosystem” (p. 16), with the research library shifting from “its role as knowledge service provider within the university to become a collaborative partner that catalyzes evolution” (p. 17). The meeting predicted that research libraries would be active across institutional boundaries and heavily focused on collaborative roles (Neal, 2014, p. 613).

In examining the role of the academic research library in supporting research, Luce (2008a) describes libraries as “the microcosm of the university” when it comes to expanding roles and developing new types of partnerships. He writes: “In a knowledge economy, characterized both by collaboration and competition in science, the enabling infrastructure and support systems are fundamental to competitiveness and scientific leadership” (p. 18). Digital scholarship and the challenges associated with research data offer libraries the chance to shed their “support service” label and become research collaborators (Corrall, 2013). As an integral stakeholder, the library needs to take collaboration to the next level – to become a proactive adaptive strategic partner.
The library as a strategic adaptive partner

A key to responding to these drivers is the formation by the library of strategic partnerships both within and beyond the university. As the main authority in the university about the ways in which knowledge is generated and transmitted (MacColl, 2010), the library should leverage its position to lead through vision and strategic initiative. At the institutional level, libraries should establish “the vital role they play in the knowledge creation process” (Tenopir et al, 2012, p. 3). In the new paradigm of collaboration and partnerships, libraries must emphasize proactive outreach and engagement by taking an active role as conveners among the different stakeholders (Luce, 2008b) as well as considering collaborative initiatives with external entities (Potter et al., 2011).

Matthews (2014, p. 1) writes: “If the research library shifts from its role as a knowledge service provider within the university to become a collaborative partner then it becomes a more valuable knowledge and service partner for the university, which is, itself, becoming more distributed and more connected. And if we think about unbundling research libraries from single sites—single universities—then they can take on other roles and other partners.”

Within the field of research, the library can add value and impact as both an active internal and external partner across the complete research lifecycle. Many libraries are gearing up for more active roles in research, as noted by Corrall (2013) with respect to the UK; Jaguszewski & Williams (2013) with respect to the US; and Ayris (2012) with respect to Europe.

In assessing what libraries could contribute to a successful research partnership (Mohr & Spekman, 1994; Martínez-Jerez, 2014; Giesecke, 2012), we can define our capabilities as:
If we consider the context in which we are operating, as outlined above, and the core capabilities libraries bring to a partnership, there are two obvious areas where libraries can create significant value and impact for research within their universities by strategically partnering:

1. maximizing the impact of research outputs
2. managing research outputs, particularly data, as an asset.

Partnerships in action - maximizing the impact of research outputs

In a world where knowledge and its application is seen as the key to global competitiveness, the world’s developed and developing nations have renewed their focus on knowledge innovation as a driver of national prosperity, advocating a central role for universities. As a result, governments seek to measure the quality of their universities and the contribution they make to the nation’s prosperity. The impact of a university’s research is a significant element of a university’s contribution (O’Brien, 2010).

Governments and funding bodies also wish to maximize the economic and social returns from any public investment in research. In several Commonwealth countries, accountability is measured among universities by means of a research assessment exercise. The United Kingdom has established its Research Excellence Framework, while New Zealand universities are required to meet the requirements of the Performance-Based Research Fund (PBRF). In Australia, the Excellence in Research for Australia (ERA) initiative is designed to provide benchmarking data for Australian universities compared with international measures (Simons & Richardson, 2012).

As we look toward the future, the changing scholarly communication landscape is increasing the potential to enhance research impact, and also increasing the inherent complexity.
From a researcher’s perspective, one of the greatest challenges for disseminating research is choosing where to publish (Harley, 2010). With the advent of the author-pays-for-publication model, the rise of predatory publishers, and research-granting agencies requiring open access to publicly-funded research outputs, the publishing landscape has become even more complex.

Increasingly, the library is taking a leadership role in partnering with researchers to ensure the outputs of their research, including publications or research data, are accessible and appropriately managed and curated. Through such partnerships, researchers can more effectively navigate the rapidly-changing scholarly communication landscape to create strategic value for the university. Not only are librarians seeking to ensure that the works of scholars are captured and curated, but also that discoverability, and hence potential impact, is maximized.

One response to this challenge has been that of the University of New South Wales. In 2005 it introduced the Research Impact Measurement Service (RIMS), to realign its services to support the university’s goals (Drummond & Wartho, 2009). Recognizing the increasingly competitive nature of the research environment and a renewed emphasis by the university on research outcomes, the library offered a new bibliometric service providing comparative publication and citation data to schools and faculties. Knowledge gained through this process has informed collection development and training opportunities for the academy on higher-impact publishing.

At the Bernard Becker Medical Library of Washington University, librarians have worked with research investigators and clinicians to develop a more comprehensive model for the assessment of research impact than just citation analysis (Sarli et al., 2010). The proposed Becker Model has been designed to provide a more comprehensive overview of the research impact of medical investigators’ study findings. Shaffer (2013) has chronicled a number of
expertise systems – in which libraries are key players – which have been built to highlight the interests and accomplishments of researchers at an institution.

Within the scholarly communications ecosystem, scholarly publishers—university presses, academic societies, research institutions—are key players. They strive to fulfil the mission of “making public the fruits of scholarly research” as effectively as possible within that ecosystem (Withey et al., 2011, p. 398). While that mission has remained constant, in recent years the landscape has altered dramatically, particularly in regard to a new role for libraries. As Borgman (2010, p. 13) so aptly encapsulates the shift: “The role of libraries in research institutions is evolving from a focus on reader services to a focus on author services.”

A 2010 study (Harley et al.) has shown that scholars across a broad range of disciplines have a growing interest in electronic publication, and that scholars embrace the potential of linking final publications directly to data sets and/or primary sources material, though most of those interviewed believed they did not have access to easy-to-use tools or to the expertise required. Publishing is seen as an emerging role for libraries as it becomes easier to implement e-press services. Hahn (2008) found that in most cases, libraries were assisting scholars to move existing journals into the digital world or into open access publishing; in some cases they were publishing new titles. The overlap of expertise and demands of publishing with the knowledge and skills required by libraries has made it a natural progression.

Along with its role as co-creator in knowledge production, the academic research library has a role as infrastructure provider (Jensen et al, 2009, p. 4). In examining the changing landscape in which digital scholars find, collaborate, create and process information and, as a result, scholarship is being transformed, Wolski and Richardson (2014) have suggested a
collaborative framework for building the necessary supporting institutional infrastructure. There is a requirement to store, deliver, and preserve the resultant outputs of digital scholarship.

The library within the institution is a logical potential source of skills and expertise in managing information and preservation. To be effective, however, will require a common approach and partnership with the IT department to (a) supply the hardware infrastructure to meet the needs either provisioned locally or through the cloud; (b) to leverage external services as needed, e.g., those funded by governments or specific discipline data repositories; and (c) collaboration and partnering with other institutions to develop cost-effective solutions. This will also need to extend to better engagement with key stakeholders within the institution so as to have better points of intervention (p. 11).

As a partner in knowledge, the library is ideally positioned to add value throughout the entire research lifecycle. By facilitating greater access to a university’s research outputs for students, researchers, and the general public, the library contributes to increased exposure for potential re-use, increased citations, higher prestige, greater public value, and greater leverage of funding.

**Partnerships in action - managing research data as an asset**

Given that “research data is the new gold” (Simons & Richardson, 2013, p. 115), Borgman (2008) suggests that data may become the new “special collection” for libraries. She notes that strategies for data curation will require involvement from academics, the campus research office, the library, and instructional and information technology services. Lynch (2008) recommends that campuses create a support organization that can (1) reach out to scholars early in the data lifecycle to assist with data management and curation/preservation strategies, involving IT professionals, librarians, and archivists; and (2) maintain a close relationship with
the research and grants office. He suggests that perhaps the library take responsibility for the long-term curation of the data at an appropriate point in the lifecycle.

In 2011 the Association of College and Research Libraries (ACRL) surveyed a cross section of its members in the United States and Canada to provide a baseline assessment of the current state of, and future plans for, research data services (RDS) in academic libraries in these countries. In the resultant report (Tenopir et al., 2012, p. 3-4), three of the key findings were that:

- Only a small minority of academic libraries in the United States and Canada currently offer research data services (RDS), but a quarter to a third of all academic libraries are planning to offer some services within the next two years.

- Libraries on campuses that receive NSF funding are more likely to offer or plan to offer RDS of any type. This suggests that funding agency requirements are driving the need for RDS. As budget decisions move towards even greater accountability, it is likely that more agencies will dictate responsible data management, so the need for RDS on campus is likely to grow. If the library is not actively involved in providing these services, some other unit is likely to be pressed into service, which can diminish the image of the library as an important partner in the research process.

- Collaboration on RDS occurs most frequently with other units on campus, most often the office of research. This collaboration is an excellent way for libraries to establish the vital role they play in the knowledge creation process and to help support the valuation of the library to the campus community.

In some universities the library collaborates with the Research Office and Graduate Research School (or its equivalent) to deliver innovative support programs. Libraries are
cooperating with information technology services divisions or high-performance computing support units to provide research data management services.

The University of Michigan Library, as a specific example, has developed a model for partnering with digital humanities scholars, based on the capabilities and considerable expertise that research libraries can inherently provide (Alexander et al., 2014). The result has been win-win in that together both partners are helping to define new expressions of scholarship in an emerging field.

There is keen interest, of course, in this emerging area in other parts of the world, e.g. Australasia. In a survey of 31 of Australia’s 39 university libraries, O’Brien (2011) found that just over 50% were involved in supporting their university’s e-research activities through partnering both with external and internal groups. More than thirty external partnerships existed across the libraries. These were with state-based and national bodies created to support the Australian national research infrastructure agenda. Most prevalent were relationships with the Australian National Data Service (ANDS), an agency created to increase re-use of Australian research data through developing the Australian Research Data Commons (see http://ands.org.au). Arguably the creation of this entity, along with its approach to university partnering, have accelerated support for research data within Australian university libraries at a higher rate than in the US and Canada.

Another key driver has been the the Australian Code for the Responsible Conduct of Research, developed in its current format by the National Health and Medical Research Council (NH&MRC), the Australian Research Council (ARC) and Universities Australia. It provides a guide to responsible research practice and covers a wide range of topics associated with research, including the management of research data and associated materials, and the publication and
dissemination of research finding. The Code assigns both researchers and their parent institutions a shared responsibility to appropriately manage research data and primary materials. Another key driver has been the expected future changes in Australian funding agency requirements in relation to research data management, following overseas trends.

In September 2014 a workshop was co-facilitated by the Council of Australian University Librarians (CAUL) and the Australian National Data Service (ANDS) for university librarians: “Open data to open knowledge: the role of the academic library.” From this workshop it was evident that the majority of Australian university libraries represented now offer services to support research data.

One of the key workshop activities involved a panel session on different library approaches to supporting research and particularly research data management. Attendees were provided with five written university library case studies in advance of the workshop. The libraries represented were from Edith Cowan University, Griffith University, Monash University, Queensland University of Technology, and the University of Melbourne. Each of the five libraries completed a brief survey on “Adding value to university research,” which formed the basis for the case studies. Among the high-level categories covered were formal or informal partnerships/agreements, both internal and external to the parent organization.

Each of the libraries tended to have a combination of both informal and formal agreements with their respective Research Office. The library may assist with national research assessment exercises, e.g. Excellence in Research for Australia (ERA), and with drafting university policy and guidelines for areas with shared objectives, e.g. open access requirements and developments. Both elements may work together to support good practice in research data management through training, policy development and support, and compliance audits. In cases
in which the respective university has a “Graduate Research School” to support higher research degree students and early career researchers, the library contributes to the School’s programs.

The relationship with the respective university’s Information Technology Services is also a mixture of both informal and formal agreements. Areas covered may include the provision of infrastructure, joint research data management website, and joint training and information sessions for researchers. For Monash University, a key relationship is the library’s interaction with the Researcher Support Services section of the university’s eSolutions (Information and Communication Technologies) division. In the case of Griffith University, the Division of Information Services offers leadership and services through six integrated Portfolio groups. Of those six, two have a predominantly library focus: Library and Learning Services, and Information Management. eResearch Services and Scholarly Application Development (eRSAD) provides access to specialist eResearch technologies and library and information professionals.

The five university libraries collaborate with their respective faculties on a range of research support activities: provision of information literacy to researchers and HDRs, participation in events organized by the Graduate Research School, provision of skills development programs that include research data management, and support for formal-funded eResearch projects. Each library also works with one or more research centers within their respective university, usually to support projects. Monash University Library collaborates with the Monash eResearch Centre (MeRC) across a number of areas. Library staff meet with MeRC staff to plan and undertake faculty engagements and partnerships. The University of Melbourne Library has a formal partnership with the Faculty of Arts on the Melbourne Collaborative Research Infrastructure Programme-funded Social and Cultural Informatics Platform, which
supports researchers from the Arts, Humanities, Social Sciences, and the Visual and Performing Arts.

In terms of library support for national services, all libraries upload data to Research Data Australia, a service offered by the Australian National Data Service (ANDS). In fact, Monash University is the lead partner in ANDS; ANDS is functionally part of the library, and the Executive Director reports to the University Librarian. At the University of Melbourne, the library is leading a project as part of the ANDS-funded Open Data Collections Program in partnership with researchers in the Department of Genetics’ Hoffmann Laboratory. Griffith University is collaborating on projects with both the Queensland Department of Environment and Heritage and the national Department of Foreign Affairs & Trade’s Secretariat of the Pacific Regional Environment Programme (SPREP). In addition, thanks to library initiatives, the university is represented on the Organisation Committee and various working groups of the international Research Data Alliance.

The above examples reinforce Tenopir’s point that academic libraries need to demonstrate the expertise that they bring to the knowledge creation process. By actively seeking out opportunities to help drive their respective university’s strategic research agenda, the library becomes an invaluable partner in the research enterprise.

**Conclusion**

It seems inevitable that disruptive innovation is the new normal, requiring new ways in which organizations must evolve if they are to create value and impact. Strategic adaptive partnerships provide a mechanism by which organizations can leverage their core capabilities, while constantly innovating and adapting to a rapidly changing environment.
Academic research libraries will continue to deliver value and impact through key partnerships with the academy, with other relevant units within their universities, and with external stakeholders who form part of the research development and dissemination landscape. Librarians, by focusing on their core capabilities in information management, on being a trusted broker, and through a commitment to knowledge for all, are well positioned for the turbulent environment ahead.
References


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