

**ASSOCIATION  
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Coalition for Networked Information

# **Research Libraries as Catalytic Leaders in a Society in Constant Flux: A Report on the ARL-CNI Fall Forum 2019**

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with an introduction by Lorraine J. Haricombe  
January 2020

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## EBSCO

EBSCO Information Services is honored to sponsor the 2019 ARL-CNI Fall Forum Report. ARL and its members work diligently to advance the goals of research libraries, to provide leadership in academic library communities, and to help shape the future of academic research. We are proud to support the work of the association and its advocacy on behalf of research libraries and academic librarians. EBSCO looks forward to continuing its deep partnership with the ARL.



# INTRODUCTION

by Lorraine J. Haricombe

“Just as we judge previous generations by how they handled their period of change, so shall we be judged.”<sup>1</sup>

From Gutenberg to Google, libraries have constantly evolved to advance and respond to society’s needs. Yet, their fundamental purpose has remained the same: to provide access to trustworthy, authoritative knowledge. As such, libraries serve as sanctuaries for learning, as windows to the world, as agents for change, and as the intellectual lifeblood of the university.

Universities and learning environments also evolve to accommodate the needs and learning styles of their users. Changes are already evident in

paradigms of knowledge production, in the modes and sources of disseminating that knowledge, and in the means of accessing a growing range of information. These evolutions present an opportunity for libraries, both to evolve for today and plan for future change. How do we plan for future, currently unknown, user needs? How do we research librarians and our libraries position ourselves for leadership given the constant state of flux in higher education?

The introduction of artificially intelligent software, for example, is transforming many knowledge-based interactions. In addition, automation is rapidly displacing skills that were once indispensable.

With these new forms of human-machine knowledge, how do libraries lead and how do we steward that technology to advance research integrity and learning? Increasing automation and reliance on different technologies will affect all levels of staff throughout the library. How do we thoughtfully align staff and their skills to this new and evolving landscape? Technology, smart devices, and voice-controlled assistants are transforming how we manage our lives and simultaneously changing how we learn. How do these new technologies change the way our libraries are managed?

Finally, large-scale demographic shifts have inevitable consequences in how students approach education.

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1. Tom Wheeler, *From Gutenberg to Google: The History of Our Future* (Washington, DC: Brookings Institution, 2019).

How do we continue to engage the changing spectrum of users? What are research institutions' roles in producing productive citizens and how can libraries in the research setting contribute to the K-12 pipeline?

These questions helped inform the theme for the 2019 ARL-CNI Fall Forum: "Research Libraries as Catalytic Leaders in a Society in Constant Flux," hosted by the Association of Research Libraries (ARL) and the Coalition for Networked Information (CNI) in Washington, DC, on September 26, 2019. Participants were challenged to assert libraries' evolving roles in more active ways than working at the edges in the context of their institutions, their communities, and in the broader society. I hope this report will offer a valuable resource of ideas for libraries as connectors, collaborators, and networks that will set out a clear road map for engagement and communication between the library and the communities it serves at all levels in its institution and beyond.

Embracing the role of catalyst requires embedding renewal from within. It also requires investing resources toward systematizing the kind of innovation that will further accelerate the pace of change. Buckminster Fuller once argued that changing the course of a large tradition-bound enterprise could be accomplished not by a frontal attack, but rather by making the existing way of doing things obsolete. Fuller's memorial in Cambridge,



Massachusetts, bears the inscription, "Call me Trimtab." Richard DeMillo explains: "This is a nautical reference to a small piece of metal attached to the rudder of a large ship. Changing the course of a ship moving with momentum on the ocean does not take place by pushing against the bow. Moving the trimtab by a small amount creates a region of low pressure that grows exponentially and eventually draws the rudder, which then turns the entire ship."<sup>2</sup>

It is my hope that this report will provide the trimtabs for accelerating change.

I am grateful to all the speakers and the participants who shared their time and ideas so generously and to ARL's executive director, Mary Lee Kennedy, for authoring and arranging this report by themes and recommendations in an easy-to-read format.

Finally, I want to extend my appreciation to EBSCO for funding the publication of this report.

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2. Richard DeMillo, "The Accelerating Pace of Change in Higher Education," The James G. Martin Center for Academic Renewal, February 8, 2017, <https://www.jamesgmartin.center/2017/02/accelerating-pace-change-higher-education/>.



# RESEARCH LIBRARIES AS CATALYTIC LEADERS IN A SOCIETY IN CONSTANT FLUX

## FALL FORUM - 2019

Catalytic leaders look forward. They lead with a vision for something new, and as needed, by working through resistance. Libraries have been catalytic leaders in the past and are committed to doing so today.

Some examples of catalytic leadership include HathiTrust, Internet Archive, OpenDOAR, SimplyE, Portage, Global Sustainability Coalition for Open Science Services (SCOSS), and Invest in Open Infrastructure. As society shifts due to digital innovations that blur the lines between the physical, digital, and biological, so do research libraries in order to serve a broad mission of

advancing human capacity to discover, produce, and share knowledge.

The 2019 ARL-CNI Fall Forum brought together leaders of research institutions, research support services, and research libraries from across Canada and the United States. Participants gathered to understand what research libraries are doing as catalytic leaders now and to discuss and recommend what more they can do to contribute to their institutions, the research and learning ecosystem, and society.

The Fall Forum keynote speaker, panelists, and participants discussed

four themes intent on identifying current catalytic leadership examples, opportunities, and a set of recommendations. The four themes were:

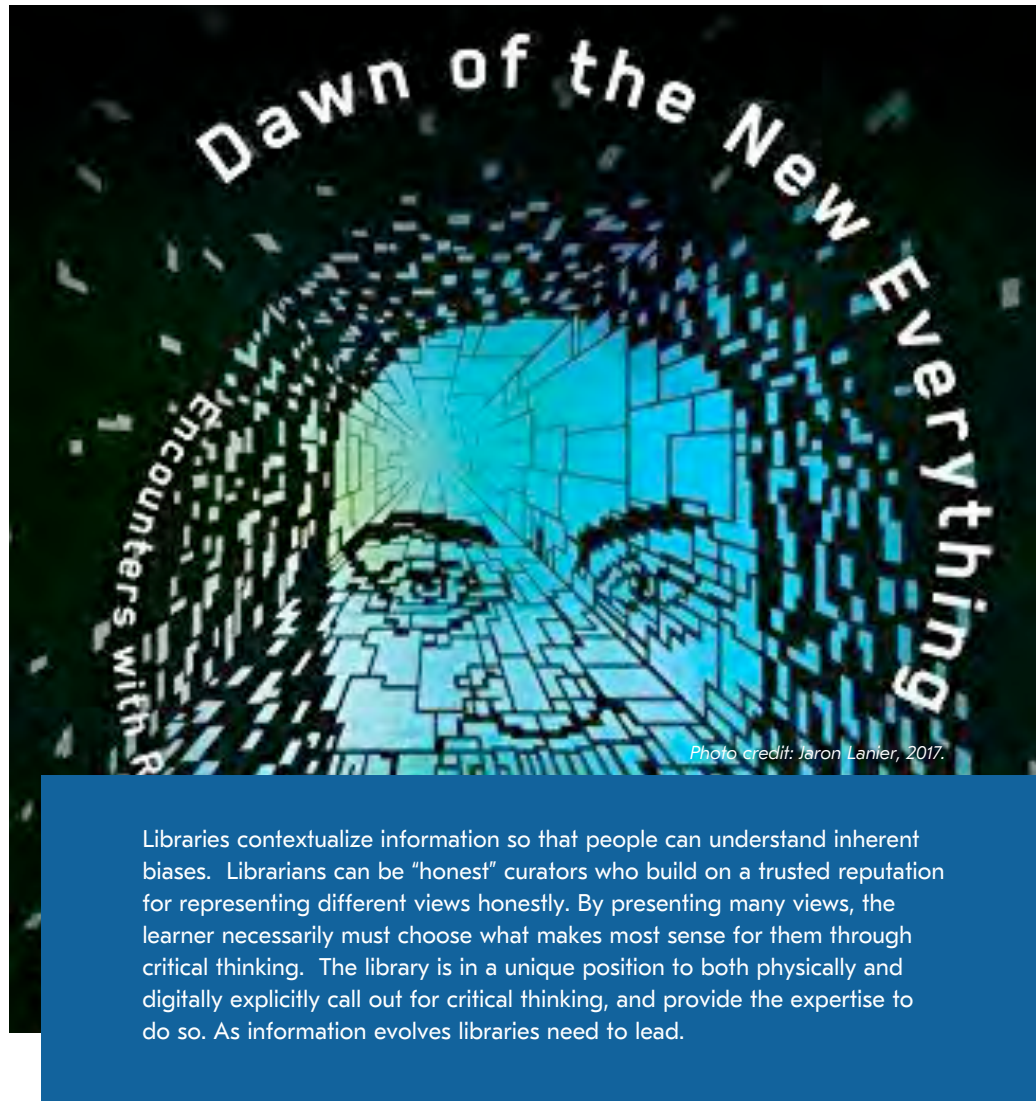
1. Libraries as strategic institutions in societal flux
2. Emerging opportunities for research libraries as collaborative partners in the changing research and learning ecosystem
3. New forms of reality to advance research integrity and learning
4. Next generation organizations, skills, and competencies needed for research libraries

This report is a reflection of the conversations during the day together. It does not represent the perspectives of all participants, panelists, or the keynote speaker. The report highlights specific discussions, provides other related examples, and concludes with the shared recommendations. As a reflection at a point in time, this report seeks to increase understanding of the opportunities for research libraries as catalytic leaders today.

## Libraries as Catalytic Leaders in the Context of Societal Flux

Described as a Renaissance man of the 21st century, Jaron Lanier gave the opening keynote. A computer scientist, composer, artist, and author, Lanier writes on numerous topics, including high-technology business, the social impact of technology, the philosophy of consciousness and information, internet politics, and the future of humanism. He was integral to the development of the World Wide Web, and more recently, to virtual reality. We asked Lanier to situate our conversation for the day in the context of current digital innovations. We specifically asked him to speak to the unique catalytic leadership role of the research library.

Using the internet as a historical reference point,<sup>3</sup> Lanier spoke about two unique roles for research libraries as catalytic leaders as society once again engages in an



Libraries contextualize information so that people can understand inherent biases. Librarians can be “honest” curators who build on a trusted reputation for representing different views honestly. By presenting many views, the learner necessarily must choose what makes most sense for them through critical thinking. The library is in a unique position to both physically and digitally explicitly call out for critical thinking, and provide the expertise to do so. As information evolves libraries need to lead.

intense period of digital innovation. The two opportunities for research libraries are as:

- The keepers of context
- The last space in which people learn through manipulation-free curiosity

### The Keepers of Context

Context provides meaning. We are now part of a world in which context is challenged, possibly even challenging meaning.

As at the time of the birth of the internet, those who actively engage in the creation of digital innovation generate significant power, in this case by using data to serve their purposes. We experience the significance of data every day as personal devices track our behavior, advise us, and predict our next preferences; security systems read our faces; and research institutions launch data centers and support services to attract and retain researchers whose interests focus on exploring massive amounts of data

3. Jaron Lanier noted the qualities the internet was lacking at its birth as a revolutionary innovation: interoperability, information provenance, a record of history, and associated storage. The internet also began with a human worldview in which power and access were available to all, and the now-proven false assumption that everything was going to be free.

to generate new forms of knowledge. For Lanier, and for others who study the digital revolution, there is a concern about people in general, and students, even researchers, in particular, being unable to understand the context. And, there is a concern about how the lack of context can lead to unexpected consequences. Depending on the source, advancements in the use of data in applications such as machine learning are lifesaving and life enhancing or capable of the most destructive actions. In this quickly changing time of innovation, research libraries can help people understand the information context in order to determine meaning, and to act ethically. Librarians have the potential to meet the need of all people to know when what they hear is the truth, and to inform ethical choices.

The internet demonstrated that there can be more information than any one institution can hold in one place. We've also seen a significant increase over the past few years in data and data centers. A recent New York Times Magazine article cited 504 hyper-scale data centers in the world today occupying about 125 million square feet; 4% of them are in Canada, 38% of them in the United States.<sup>4</sup> Most of the hyper-scale data centers are in the hands of the big technology companies. In these cases the data is not publicly available, let alone stewarded by research libraries. This doesn't mean researchers don't seek to use it—many do—but research libraries are not always engaged in the transactions. With the data

**The World Wide Web Foundation published a Contract for the Web in 2019 committed to nine principles for governments, companies, and citizens. The foundation states: "The free and open web faces real challenges. Half the world's population still can't get online. For the other half, the web's benefits come with too many risks: to our privacy, our democracy, our rights. We need to build a better web."**

—"A Contract for the Web," World Wide Web Foundation, accessed December 9, 2019, <https://webfoundation.org>

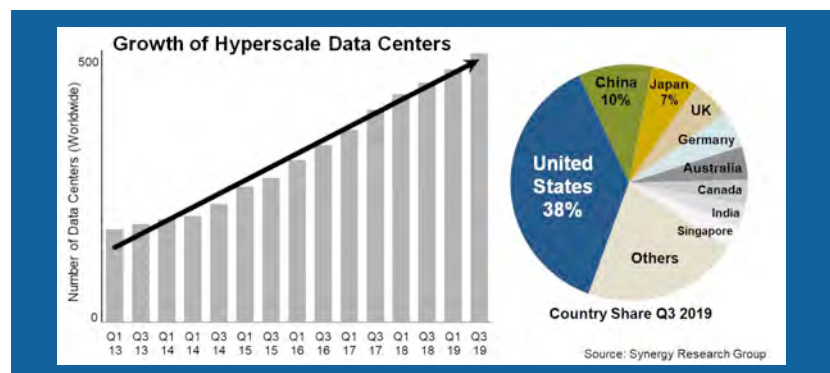
explosion, libraries can do even more to make the data discoverable, by bringing together collections of all kinds. Specifically, they can work collaboratively to provide access to data sets within and across disciplines and institutions, to connect them with public and private sources, regardless of whether the libraries "own" them. And, as collaborative partners, libraries can work with the research and learning community, and with institutional and public policy leaders to establish sustainable solutions for knowledge access to

avoid some of the resulting challenges from innovation—as the data-centric and enormous volume of information intensifies.

For Lanier, research libraries are "mediators of individual data (MIDS)". MIDS know the data universe better than anyone else. They are the fiduciary of today's information universe. In other words, as an institution, the library could be one of the trusted information settings that without bias facilitates a history of the data, stores it, clarifies data provenance (supporting individual ownership of one's data), and ensures interoperability.

### The Last Space in Which People Learn through Manipulation-free Curiosity

Lanier spoke about the library as an institution where people have the opportunity to escape digital surveillance to discover their personhood, and learn through manipulation-free curiosity. Recognizing that very few physical spaces, including libraries, are free of surveillance, the library has a unique role in framing and advocating for legislation—as well as educating users—about intellectual freedom, inclusion, privacy, and data



4. "So the Internet Didn't Turn Out the Way We Hoped. Where Do We Go from Here?," *New York Times Magazine*, accessed December 5, 2019, <https://www.nytimes.com/interactive/2019/11/14/magazine/internet-future-dream.html>.

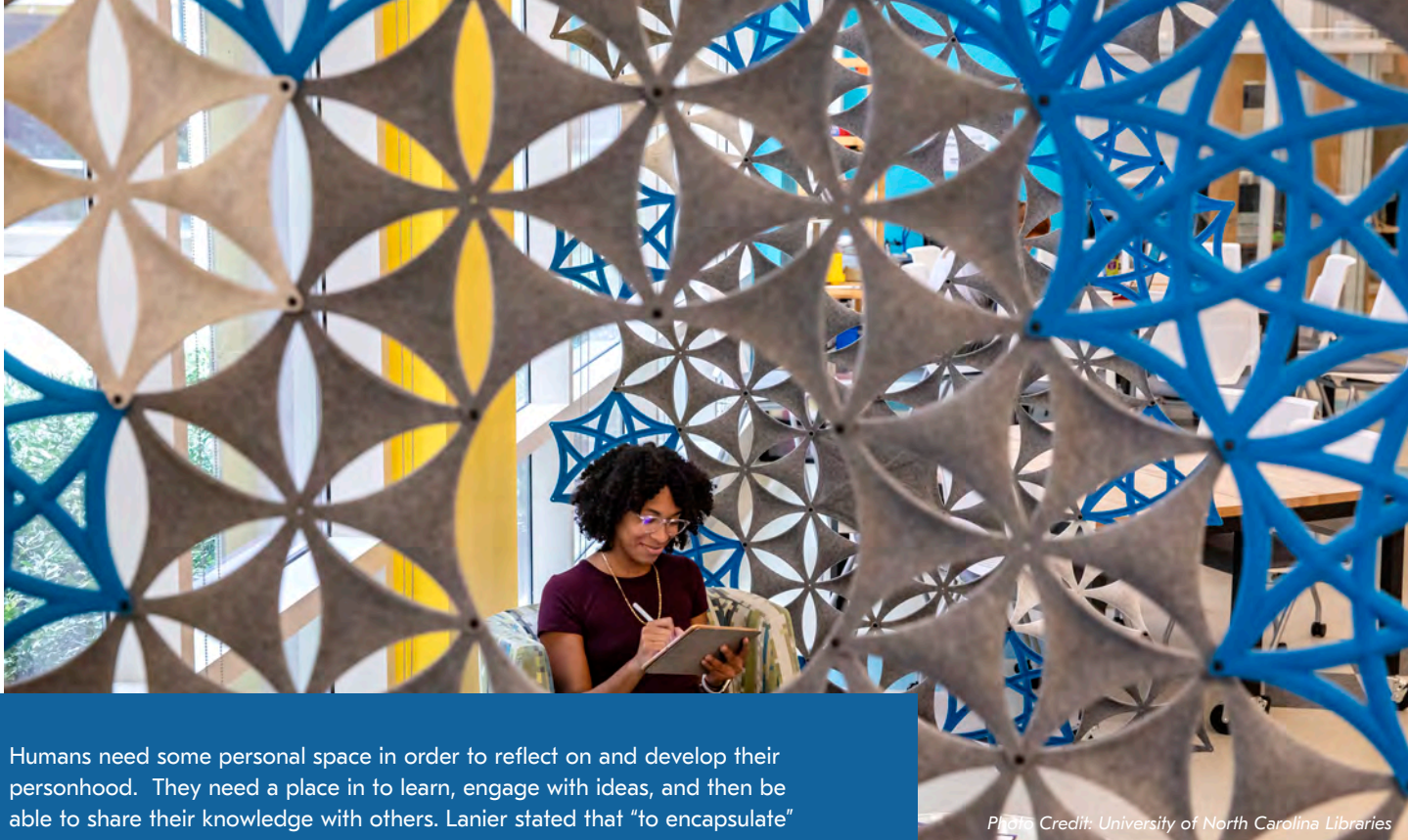


Photo Credit: University of North Carolina Libraries

Humans need some personal space in order to reflect on and develop their personhood. They need a place in to learn, engage with ideas, and then be able to share their knowledge with others. Lanier stated that “to encapsulate” in this way is vital and that libraries are a key place where this happens.

regulation. Librarians can make users aware about surveillance by informing them, and providing a contrast to the constant digital engagement and persuasion that exists in their daily lives.

Humans need personal space to reflect on their personhood and to regenerate in order to be ready to share again. Lanier calls this action “to encapsulate.” Libraries offer such a place, in contrast to the constant state of implicit and explicit manipulation that Lanier sees making people irritable and even paranoid. It is difficult to “encapsulate” in many settings today, as algorithms constantly define what we see and influence how we feel. For Lanier, libraries can counter this effect through the user experience, through public policy and advocacy, through standards setting and governance, and through

informed explanations of the data and information context as they are presented or discovered by people in their daily lives, and as they learn to learn.

In summary, at the dawn of the internet, the aspiration was that no one would own the network and everyone would engage fairly. We now know this did not happen. With a digital revolution again providing opportunities to shape the future in still unimaginable ways, libraries can

be arbitrators and curators who build a trusted reputation for representing different views honestly. For example, they can contextualize information so that people can understand inherent biases. By presenting many views, the learner can choose what makes most sense for them through critical thinking. The library is in a unique position to both physically and digitally provide space for critical thinking, and provide the expertise and advocacy needed to do so.

**Klaus Schwab calls for leaders and citizens to “together shape a future that works for all by putting people first, empowering them and constantly reminding ourselves that all of these new technologies are first and foremost tools made by people for people.”**

*The Fourth Industrial Revolution* (Geneva, Switzerland: World Economic Forum, 2016), <https://www.weforum.org/about/the-fourth-industrial-revolution-by-klaus-schwab>.

## Participant Recommendations for Research Libraries as Catalytic Leaders in the Context of Societal Flux

Fall Forum participants provided recommendations for research libraries in society, in and among research institutions, and in and among research libraries. Note that these are not necessarily mutually exclusive categories.

### In society, research libraries can:

- Lead on information ethics, including creating a new framework for privacy, while acknowledging the importance of private-public partnerships in providing access to data and information
- Level the playing field for access—no one else is doing this. Specific ways to do so include:
  - Being an active agent of content decolonization and inclusion
  - Being an active agent for free speech and inclusion
  - Setting standards for digital platforms such as the e-book ecosystem, digital humanities, and data repositories
  - Building the human skills required to support the ongoing adoption of new practices
- As a keeper of context, lead in community engagement and awareness
- Partner in the reconfiguration of the economic infrastructure of scholarship such as SPARC's publishing landscape analysis<sup>5</sup>

### In and among research institutions, research libraries can:

- Support knowledge creation and curation by leading information management policy and practice, particularly of research data, including data analysis and visualization, social media, and emerging and future forms of scholarship

- Lead on open access and open educational resources in order to increase the affordability of higher education
- Provide data-science education services, including education on ethical uses
- Be a digital scholarship partner with faculty. Participant examples include: Temple University Libraries director of digital scholarship, The Ohio State University's digital pedagogy institute for faculty, and digital carpentries
- Provide information expertise by assisting people in critical thinking and problem-solving. An example is Auburn University's campus-wide digital literacy initiative.

### In and among research libraries, research libraries can:

- Preserve the human record in print and the new historical record of data, dynamic digital scholarship, and social media<sup>6</sup>
- Provide places for creation and experimentation, particularly for the exploration of developing new skills, for example, virtual reality/augmented reality labs
- Exercise the transformative power of aggregated digital and physical collections. For example, The Seven Sisters Colleges' collective collection, ReCAP, the Big Ten Academic Alliance Big Collective Collection.

5. Claudio Aspesi et al., *SPARC Landscape Analysis: The Changing Academic Publishing Industry—Implications for Academic Institutions* (Washington, DC: SPARC, March 2019), <https://sparcopen.org/our-work/landscape-analysis/>.

6. See Carol Mandel's work on whether or not we are preserving enough of born digital content at "Are We Doing Enough to Manage and Preserve Born Digital Content?" Council on Library and Information Resources, October 3, 2019, <https://www.clir.org/2019/10/are-we-doing-enough-to-manage-and-preserve-born-digital-content/>.



## Emerging Opportunities and Research Libraries

Given the above context, the panelists—Susan Haigh, Canadian Association of Research Libraries; Gina M. Siesing, Bryn Mawr College; and Louis Soares, American Council on Education, moderated by David Leonard, Boston Public Library—and forum participants explored emerging opportunities to shape the future of the research library in a society in constant flux, recognizing the challenges involved in doing so. Several emerging opportunities were identified for research libraries as partners both within and across institutions.

Fundamentally, research libraries must position themselves to demonstrate value and be prepared to meet the demand for new services. This will require staff who are prepared to deliver the services in a time of continual flux when change is the norm, and leaders are able to position the research library within a confluence of priorities and external pressures on institutions in higher education, and to lead collaboratively with a broad range of partners.

### Summary

The library is an institution committed to intellectual exploration in pursuit of understanding and knowledge creation. With changes occurring in society, research, and learning, research libraries are evolving and will continue to do so. The participants highlighted opportunities relating to inclusion and equity, open science, data policies and practices, the value of higher education, and reflective spaces.

Research libraries are extending their relationships in research institutions and in local

communities as our society struggles to become more inclusive and equitable. Faculty, librarians, and campus and civic leaders seek to respond to and engage in sometimes explosive decisions about free speech and inclusion/exclusion. They lead cultural heritage conversations, including engaging the community in the research itself. They connect and catalyze communities around social crises. Participants highlighted the following examples: Washington University in St. Louis's website Documenting Ferguson,<sup>7</sup> and Northeastern University's documentation of the Women's March.<sup>8</sup> They inform students and

7. Documenting Ferguson website, accessed December 11, 2019, <http://digital.wustl.edu/ferguson/>.

8. Art of the March website, accessed December 11, 2019, <https://web.northeastern.edu/nulab/art-of-the-march/>.

others in navigating the complex information landscape, such as the emergence of cheap and deep AI fakes.

An urgent opportunity for research libraries is to firmly establish their expertise and value in open science,<sup>9</sup> particularly relating to open research data, administrative and civic data, and with respect to public and institutional policy, governance, legislation, and practice. With national open science agendas, such as those of Australia, Canada, the EU, and the US National Academies' Open Science by Design consensus report from 2018,<sup>10</sup> the research library community has an opportunity to shape adoption and implementation of national and institutional policies. Research libraries can do more as trusted partners with research communities (for example, the Center for Social Media and Politics,<sup>11</sup> Data & Society,<sup>12</sup> and the Social Science Research Council<sup>13</sup>), and institutional and public policy decision-makers to establish and implement ethical policies and governance structures, and to raise awareness of the human implications. Research libraries can be trusted allies for the reader and

researcher as information (now information plus data) advisors, curators, and providers. One example of the research library role is “explainable AI.”<sup>14</sup>

While research libraries see an even greater opportunity to shape institutional, civic, and public data policy and practices, several existing examples were shared: “smart city” programs in Toronto and Calgary, civic data centers in Boston and New York, and data science education at the University of Virginia.

**The Boston Area Research Initiative (BARI) is an interuniversity partnership that pursues original urban research on the cutting edge of scholarship and public policy, with an emphasis on opportunities created by novel digital data.**

—Boston Area Research Initiative website, accessed December 9, 2019, <https://www.northeastern.edu/cssresearch/bostonarearesearchinitiative/>

Nevertheless, with the exponential growth of data science and data analytic centers across Canada and the United States offering certificate, bachelors and masters degrees, research libraries have an opportunity to define a role or a variety of roles to play.

The reader will know that in the United States the value of higher education is being questioned. Fall Forum participants discussed three topics: (1) affordability, (2) the purpose of higher education as workforce development or intellectual pursuit, and (3) perceptions of higher education institutions as harbingers of liberal politics. The participants identified the need for a new, shared narrative on the value of higher education, and specifically how research libraries can contribute.

- The research library can do even more to be an interlocutor between academic research and public knowledge. They can provide access to a plurality of voices in collections, by contributing to commonly used sources of information such as Wikipedia, by posting research

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9. Open science is transparent and accessible knowledge that is shared and developed through collaborative networks (see Ruben Vicente-Sáez and Clara Martínez-Fuentes, “Open Science Now: A Systematic Literature Review for an Integrated Definition,” *Journal of Business Research* 88 (July 2018): 428–436, <https://doi.org/10.1016/j.jbusres.2017.12.043>). Open science encompasses a variety of practices, including open access to publications, open research data, open source software/tools, open workflows, citizen science, open educational resources, and alternative methods for research evaluation including open peer review (see Nancy Pontika et al., “Fostering Open Science to Research Using a Taxonomy and an eLearning Portal,” in *i-KNOW '15: Proceedings of the 15th International Conference on Knowledge Technologies and Data-driven Business* (New York: ACM, 2015), <http://dx.doi.org/10.1145/2809563.2809571>).
  10. National Academies of Sciences, Engineering, and Medicine, *Open Science by Design: Realizing a Vision for 21st Century Research* (Washington, DC: National Academies Press, 2018), <https://doi.org/10.17226/25116>.
  11. Center for Social Media and Politics website, accessed December 11, 2019, <https://csmmapnyu.org/>.
  12. Data & Society website, accessed December 11, 2019, <https://datasociety.net/>.
  13. Social Science Research Council website, accessed December 11, 2019, <https://www.ssrc.org/>.
  14. Michael Ridley, “Explainable Artificial Intelligence,” *Research Library Issues*, no. 299 (2019): 28–46, <https://doi.org/10.29242/rli.299.3>.

library content in social media such as YouTube, and by making the collections visible through partnerships with learned societies, museums, and other cultural institutions.

- More could be done to build trust by making the expertise of the university available to different audiences, for example, through seeking partnerships with local media and with learned societies (such as the Social Science Research Council's MediaWell<sup>15</sup>).
- Research libraries can partner with public libraries to build trust. In general, public libraries see themselves as part of a continuum in lifelong literacy and research libraries see themselves as part of the student or faculty experience. Examples of how they are already creating trust include working together to identify strategies and tactics to provide universal access to information, specifically e-books. Together with the K-12 community, they seek to provide students with the skills they need to be ready for their freshman year, and they seek to create social infrastructure for student success, particularly with changing student demographics.

Research libraries have designed and implemented new physical spaces that accommodate reflective and collaborative space, acknowledging that students are more connected than ever, yet



Research libraries collaborate within and across institutions to navigate and implement proven practices pertaining to free speech, civil discourse, psychological safety, inclusion, and use of libraries spaces as a center for community and connection. Including the work of research libraries more deliberately in these spaces — Galleries, Libraries, Archives, Museums, and Research Libraries — provides opportunities for our institutions to support our community connections that are central to the creative and knowledgeable society.

lonely. In libraries one can be alone, but not lonely, in a social space. This space leadership role reflects Lanier's concept of "encapsulation" and libraries as a space for "manipulation-free curiosity." Examples provided by participants included Smith College's campus task force to address loneliness.<sup>16</sup> Other space designs discussed included yoga-type space, "non-productive" space (no laptops), and cell-phone-free spaces.

Research libraries are transforming as emerging opportunities impact society and the research and learning ecosystem. The participants shared specific opportunities. They emphasized that now research libraries need to establish a vision or models for the research library in the context of emerging opportunities, based on a set of priorities, ensuring research libraries have the requisite talent and courage to take them on.

15. MediaWell website, accessed December 11, 2019, <https://mediawell.ssrc.org/>.

16. Kathleen McCartney, "Advancing Campus Climate," Smith College, January 25, 2018, <https://www.smith.edu/president-kathleen-mccartney/letters/2017-18/advancing-campus-climate>.

## Participant Recommendations for Research Libraries as Catalytic Leaders Given the Emerging Opportunities

Fall Forum participants provided recommendations for research libraries in society, in and among research institutions, and in and among research libraries. Note that these are not necessarily mutually exclusive categories.

### In society, research libraries can:

- Collaborate with communities and historical societies to create a shared narrative on the value of research libraries in support of higher education  
Example: The University of Wisconsin iSchool works with Native nations on language preservation and collaborates with a historical society.
- Increase access to open materials such as the work of The University of Texas at Austin with the Austin Public Library to provide open educational resources (OERs) to the Austin Independent School District and to people working on their general education diploma (GED).
- Make university expertise available to local media, or offer the option to “check out a faculty member” via the public library

### In and among research institutions, research libraries can:

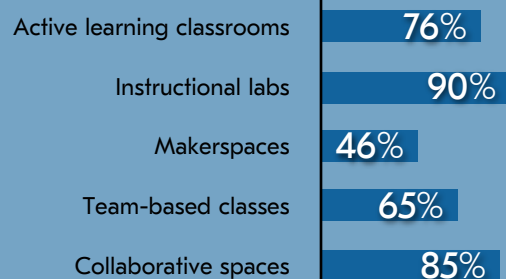
- Share and use examples of a shared community narrative
- Lead and partner with institutional-data and public policy decision-makers such as the Canadian Research Knowledge Network<sup>17</sup>, Portage,<sup>18</sup> National Science Foundation “Dear Colleague Letter”<sup>19</sup> and subsequent work on persistent identifiers for data<sup>20</sup>

- Create models for collaborating with galleries, archives, and museums on emerging opportunities in research and learning

### In and among research libraries, research libraries can:

- Create case studies for how to scale or replicate proven practices such as the EDUCAUSE Horizon Report
- Establish a framework for partnering with public libraries
- Explicitly help students with critical thinking (acknowledging that this can be challenging) such as exploring the parallel between doing a literature review for an assignment and using this skill in daily life.

### Technology-enhanced spaces that are provided by colleges and universities:



—CDS data as of March 8, 2019, for US institutions with Carnegie Classifications of AA, BA, MA, or DR.

EDUCAUSE Horizon Report | 2019 Higher Education Edition

17. Canadian Research Knowledge Network website, accessed December 11, 2019, <https://www.crkn-rcdr.ca/en/home>.

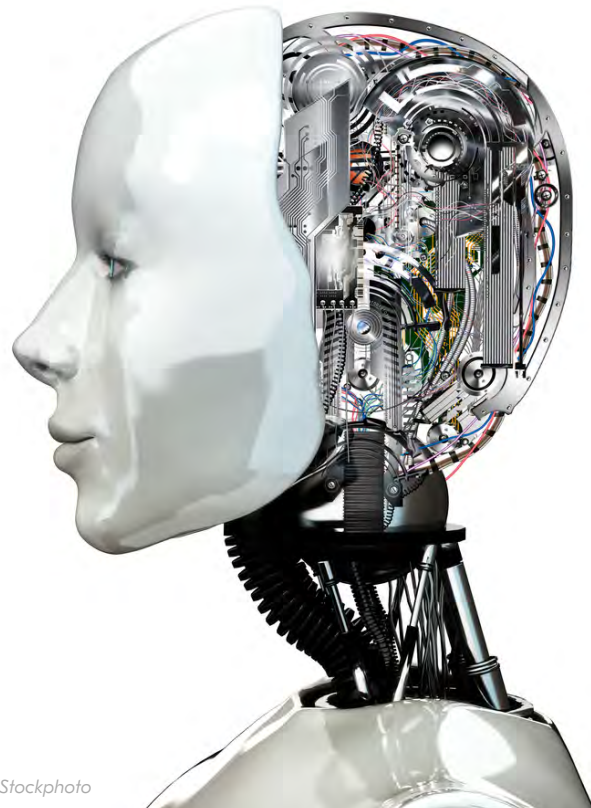
18. Portage Network website, accessed December 11, 2019, <https://portagenetwork.ca/>.

19. “Dear Colleague Letter: Effective Practices for Data,” National Science Foundation, May 20, 2019, <https://www.nsf.gov/pubs/2019/nsf19069/nsf19069.jsp>.

20. “Implementing Effective Data Practices: A Conference on Collaborative Research Support,” (conference, Association of Research Libraries, Washington, DC, December 11–12, 2019), accessed December 9, 2019, <https://www.arl.org/event/implementing-effective-data-practices-a-conference-on-collaborative-research-support-invitation-only/>.

## Research Libraries, AI & New Forms of Reality

While many research libraries are experimenting with AI, and specifically machine learning, most have not transformed their organizations. Clarity is needed on a shared vision for research libraries given new forms of reality and artificial intelligence. The ARL-CNI-EDUCAUSE collaboration initiated this past summer will help inform a shared vision. It seeks to understand how emerging technologies and disciplines such as data science, artificial intelligence, mobility and ubiquitous networking, cloud and ambient computing, augmented/virtual reality, and the internet of things are—and are not—fundamentally transforming the way research and learning occur. The collaboration will share a current state analysis of research library adoption and support of emerging technologies, a summary of opportunities, and a set of recommendations for desirable and achievable outcomes and associated actions for research libraries.<sup>21</sup> This session's panelists—Jason Griffey, NISO and metaLAB, and Keith Webster, Carnegie Mellon University, moderated by Carl Grant, University of Oklahoma—and participants engaged in a conversation on the leadership role of research librarians as new forms of human-machine knowledge are created, and how they will steward it to advance research integrity and learning.



*Photo credit: iStockphoto*

Machine learning, specifically, is an emerging technology that is most impactful in our wellbeing, healthcare, the physical sciences, and the service industry (e.g. chat bots). Machine learning robotics such as Sofia challenge us to think about the very nature of humanity. Our leadership role deepens as new forms of human-machine knowledge are created. Libraries and librarians, as keepers of context, need to collaborate on sustainable solutions to knowledge access — even as the data-centricity and enormity of the volume intensify.

### Summary

Although experts explain there is a long way to go before machines think like human beings, every step of the research process could be, and some suggest will be, changed by AI, including some projections that AI will be able to do much of the work of research libraries. The panelists and participants identified machine learning as the most significant emerging technology for research libraries, both in terms of their support of research and learning, and in research library practices. For

the purposes of this paper, machine learning is defined as, “the scientific study of algorithms and statistical models that computer systems use to perform a specific task without using explicit instructions, relying on patterns and inference instead. It is a subset of artificial intelligence.”<sup>22</sup> The focus of the conversations were on machine learning specifically, and more generally on artificial intelligence.

Technology moves in exponential time, and for most humans, time moves at the speed of trust. This lack

21. Mary Lee Kennedy, “ARL, CNI, EDUCAUSE Form Strategic Partnership to Advance Research Libraries’ Impact in a World Shaped by New Technologies,” Association of Research Libraries, August 16, 2019, <https://www.arl.org/news/arl-cni-educause-form-strategic-partnership-to-advance-research-libraries-impact-in-a-world-shaped-by-new-technologies/>.

22. “Machine Learning,” Wikipedia, last edited December 6, 2019, [https://en.wikipedia.org/wiki/Machine\\_learning](https://en.wikipedia.org/wiki/Machine_learning).

**Thomas Padilla's recent report on *Responsible Operations: Data Science, Machine Learning, and AI in Libraries* furthers the shared vision of what libraries can do. It charts library community engagement with data science, machine learning, and artificial intelligence (AI) and it presents seven challenges organized across seven areas of investigation:**

- Committing to Responsible Operations
- Description and Discovery
- Shared Methods and Data
- Machine-Actionable Collections
- Workforce Development
- Data Science Services
- Sustaining Interprofessional and Interdisciplinary Collaboration

—Thomas Padilla, *Responsible Operations: Data Science, Machine Learning, and AI in Libraries* (Dublin, OH: OCLC Research. 2019), <https://doi.org/10.25333/xk7z-9g97>.

of synchronicity presents a significant need and opportunity for research libraries as translators and trusted advisors. This is even more urgent given the rapid speed of changes in the nature and use of information, related ethics, and questions of information and data governance and legislation. This lack of synchronicity impacts library staff as much as research library users. The participants discussed next generation organizations, skills, and competencies and this is covered starting on page 18.

One logical starting point for developing a shared vision is to develop a shared set of AI principles and norms. Over the past few years, governments, societies, and nonprofit organizations have done so. Research libraries could consult the AI ethics that exist, and efforts

that are underway. Several are covered in the September 2019 issue of *Research Library Issues*<sup>23</sup>—including initiatives in Canada, the European Union, France, Germany, Japan, the Organization for Economic Co-operation and Development (OECD), and the United States. More specifically, research libraries could align with scientific communities, such as the US National Institute of Standards and Technology (NIST),<sup>24</sup> the IEEE Global Initiative on Ethics of Autonomous and Intelligent Systems,<sup>25</sup> and discussions within research institution departments.

By learning more about AI and by engaging with the research and learning community and public policy leaders, research libraries can shape the related international, national, and institutional policies

and laws that govern them. Locally, with knowledge of AI and engagement in the policy, regulation, and governance of it, research libraries can educate their communities about opportunities and threats. Participants shared their own work to do so. Examples included the Digital Skills Hub at The University of Oklahoma,<sup>26</sup> where it is possible to learn about tools and how they can be manipulated to shape one's view and behavior; the course on Discovering the Data Universe at Carnegie Mellon University;<sup>27</sup> and work with data labs in government and research institutions.

Participant discussions also focused on AI uses of administrative data and the role of research libraries. The conversation centered on data policy and practice. Libraries inform and grapple with privacy policies and practices as the tension between convenience and privacy plays out in our daily lives including and in the context of research and learning. While research libraries also collect student and faculty data, they tend to have varying degrees of influence on institutional policy. One way to do so is to advocate for a privacy officer, and to engage with the CIO and the vice president of research on user privacy, platform-licensing terms, and content acquisition and management. There are privacy officers roles today, including at the New York Public Library and the University of Colorado Boulder.

23. Mary Lee Kennedy, "What Do Artificial Intelligence (AI) and Ethics of AI Mean in the Context of Research Libraries?" *Research Library Issues*, no. 299 (2019): 3–13, <https://doi.org/10.29242/rli.299.1>.

24. National Institute of Standards and Technology website, accessed December 11, 2019, <https://www.nist.gov/>.

25. IEEE Ethics in Action website, accessed December 11, 2019, <https://ethicsinaction.ieee.org/>.

26. Digital Skills Hub website, accessed December 9, 2019, <https://digitalskillshub.oucreate.com>.

27. "Discovering the Data Universe," Carnegie Mellon University, accessed December 9, 2019, <https://www.coursicle.com/cmu/courses/STA/36204/>.

Participants acknowledged that it can be challenging to motivate students to listen to guidance about privacy. One participant shared a story about student privacy education in a digital securities class. As part of the class, students are asked to find out as much as possible about the people they run into at the campus quad using publicly available information, including taking notes on conversations they hear, taking pictures, and mapping campus security cameras. Then they are asked to talk about what they have done, and how the information they collected relates to privacy and ethics.

Librarians are reinventing and reinvigorating the role of curator as they determine how best to use algorithms in the work of the research library. Librarians are using Google AIY Kits, providing user services with chat bots, and applying machine learning on corpuses of digital information such as dissertations (see the Hamlet project<sup>28</sup>), digital images (see the Sheeko project<sup>29</sup>), and archival discovery (see the Aida project<sup>30</sup>). The participant consensus was that research libraries can't avoid using algorithmic processes so libraries must become AI literate in order to recognize and address the biases within algorithmic "black boxes" and to use them equitably.

Data is an extremely valuable source of information today—the participants identified the need for research libraries to take on an even more active role. Libraries can take a more substantive role as a partner stewarding data sets (for example with Dryad,<sup>31</sup> Dataverse<sup>32</sup>) and filling gaps in institutional, and even discipline and interdisciplinary data stewardship. Participants called for libraries to be even more active in establishing research data management policies and practices. As stewards, librarians could do more to clarify data provenance, such as by assigning an authentication element to a data-set seal.<sup>33</sup> To do so, research libraries could establish citations that reference provenance and develop an algorithm or some type of sliding scale of algorithms that track data-set changes over time.

In this time of exponential digital innovation, research libraries, and libraries more broadly, are experimenting with emerging technologies such as machine learning as well as exploring new roles in supporting research and learning. Nevertheless, a more proactive, catalytic leadership role is sought. Now is the time for a shared vision so as to ensure research libraries deliver the most value in a sustainable way.

**"Our society is experiencing tremendous benefits from the innovation that private capital is creating. But we are also reaching a point of existential crisis. In this new reality, our libraries will need to prepare to disseminate knowledge and make it accessible in new ways. They must also become major players participating in the value creation surrounding the production of knowledge (by humans and AIs) and its delivery."**

—Sylvester Johnson, "Sylvester Johnson on Humanism in Our Technological Age," Association of Research Libraries, November 13, 2019, <https://www.arl.org/news/mary-lee-kennedy-interviews-sylvester-johnson-about-humanism-needed-in-our-technological-age/>.

28. Hamlet website, accessed December 9, 2019, <https://hamlet.andromedayelton.com/>.

29. Sheeko website, accessed December 11, 2019, <https://sheeko.org/>.

30. Aida website, accessed December 11, 2019, <http://projectaida.org/>.

31. Dryad website, accessed December 9, 2019, <https://datadryad.org/stash>.

32. Dataverse Project website, accessed December 9, 2019, <https://dataverse.org>.

33. See Ridley, "Explainable Artificial Intelligence."

## Participant Recommendations for Research Libraries as Catalytic Leaders in New Forms of Reality and Artificial Intelligence

Fall Forum participants provided recommendations for research libraries in and among research institutions, and in and among research libraries. Note that these are not necessarily mutually exclusive categories.

### In and among research institutions, research librarians can:

- Set a shared vision for research libraries as they adopt emerging technologies, given the changing nature of research and learning
- Develop model data-privacy agreements to be used with content and platform vendors
- Work with senior administrators to set ground rules for use of research and administrative data by content and platform vendors
- Shape best practices for the use of student data in learning analytics
- Advocate for privacy officers
- Adopt and use emerging technologies as an employment retention strategy for higher education
- Implement virtual reality (VR) in learning contexts, such as a VR lounge, and continue research library engagement in VR with the medical community
- Create citation standards—one to link to where data was found, one to link to archived data
- Make sure data is collected in a way that it is usable and stewarded over time

### In and among research libraries, research libraries can:

- Determine where it is most valuable to use AI and other emerging technologies, and develop a sustainable investment plan
- Set AI norms and policies
- Consider endorsing the Stanford Libraries patron privacy statement<sup>34</sup>
- Use data privacy in personal, daily decision-making so as to be able to inform others
- Partner with professional organizations to train research librarians and their staff, and to train the research and learning community in AI and emerging technologies
- Train library staff so they can run software carpentry workshops
- Craft effective communication strategies, including removing jargon
- Use AI in back of house (for example, to assign metadata to records), AI assistants (such as the Alexa Education Skill API)
- Ensure the use of AI and emerging technologies brings people back into the collections

34. Statement on Patron Privacy and Database Access,” Stanford Libraries, accessed December 9, 2019, <https://library.stanford.edu/using/special-policies/statement-patron-privacy-and-database-access>.



Photo credit: Rochester Data Science Consortium

## Next Generation Organizations, Skills, and Competencies

Change is happening quickly and is expected to increase its pace. Research libraries, like the organizations they are a part of, are grappling with the changes as they seek to continue to deliver value and sustain that value. This session's panelists—Wendy Duff, University of Toronto; Vivian Lewis, McMaster University; Eric Meyer, The University of Texas at Austin; and Denise Stephens, Washington University in St. Louis, moderated by Robert McDonald, University of Colorado Boulder—and participants focused on what leaders need to do to prepare their organizations, and what next-generation organizations, skills, and competencies research libraries need in order to thrive as collaborative partners for uncharted territory.

### Summary

The fundamental question raised by the participants was, “What is the nature of work that needs to be done?” As in the other sessions, there was a sense of urgency to set a vision or at least to establish models for research libraries to position themselves to demonstrate value and be prepared to meet the demand for new services.

In considering the nature of the work, the participants identified many opportunities to contribute in significant ways that research libraries may not be prepared to do right now. These contributions require rethinking the nature of the work—everything from policies, to the use of tools, to working relationships with faculty and the

broader community, to the design of organizational structures and recruiting policies and practices. It involves stopping some work. It requires courage by leaders and staff. It requires difficult decisions. This is a time of flux for the profession and for research library organizations. The participants focused on three categories of urgent changes: changes in the research library relationship with institutional partners, changes in the research library organization, and changes in skills.

Participants noted that all changes require strong partnerships, particularly with faculty, research administrators, and other research support services. Research libraries do and can increase their role as a

partner in establishing information standards, and as a partner in teaching and in stewarding information throughout the research life cycle, by increasing the use of librarians as expert guides or “information bridges” for students, faculty, and the broader community in the identification and interpretation of an ever-broadening universe of knowledge. While there is noticeable movement in each of these examples, there is a need for even deeper and more broadly practiced changes, recognizing this can only occur by working collaboratively within and across institutions, and preparing the workforce to succeed.

These changes also require research library leaders to be visible in shaping institutional decisions. Alignment with the broader institutional mission is absolutely essential. As research institutions are pressured by questions such as affordability, new forms of learning and research, the adjunctification of the faculty, and changing student demographics—let alone diminishing private and public funding opportunities—research libraries really have to seek ways to be more agile and more visible in both demonstrating and sustaining their value.

The panelists stated that, with the urgency to demonstrate value, changes are needed in research library organizational structures to support the evolving nature of the work. There is an unanswered question of whether or not research libraries can change fast enough.<sup>35</sup>

While structural changes are underway and being discussed, shared models of success are needed. Shared models of success may need to start out as shared experiments, as much of the new work is experimental, new skills are not widely held, and decisions about

**The 2019 Delphi Future Skills report lists 16 important future skill profiles as relevant in higher education. “The term ‘future skills’ is defined as the ‘ability to act successful on a complex problem in a future unknown context of action.’ It refers to an individual’s disposition to act in a self-organized way, visible to the outside as performance.”**

— Ulf-Daniel Ehlers and Sarah A. Kellermann, *Future Skills: The Future of Learning and Higher Education: International Delphi Survey of the NextSkills Project* (Karlsruhe, Germany: Baden-Württemberg Cooperative State University, 2019), 3, <https://nextskills.org/future-skills-report-2019/>.

what to stop doing remain pending. Participants agreed that research library leaders can help library staff learn how to be more comfortable with change in order to develop an ongoing adaptive mode in anticipation of and response to constant flux.

Research library leaders look to create and sustain value in a broader environment of constant (but not always consistent) flux, and create a work environment that is attractive to talented people who can adapt and thrive. Research libraries seek to create agile learning organizations, to adopt value-based learning, to create inclusive environments, and to encourage innovation by making it safe to “fail,” recognizing that research libraries are also part of an evolving, sometimes slowly evolving, bureaucracy. The historically acceptable and previously successful structures can make work-environment change particularly challenging. For instance, existing employment categories can create conflicts in roles and responsibilities, the usefulness of historically accepted credentials is being questioned, and success is not assured given traditional career paths. The participants cautioned that, as in any time of change, it is important to determine what we need to keep from the past, and what we can stop doing.

Research libraries face resource challenges. In many cases research libraries are challenged by the sheer scale and urgency of developing and acquiring the needed staff skills. Specifically, research libraries seek to develop and hire people with the skills to contribute to faculty and student skills development in emerging fields like data science, such as the Digital Skills Hub at The University of Oklahoma, and The Center for Research Data and Digital Scholarship at the University of Boulder, Colorado. There is also a

35. Wolfram Horstmann, “Are Academic Libraries Changing Fast Enough?” *Bibliothek Forschung und Praxis* 42, no. 3 (2018): 433–440, <https://doi.org/10.1515/bfp-2018-0061>.

challenge with ensuring a ready pipeline of skilled staff eager to work in research libraries. Research libraries compete with other organizations that also want to hire students with these skills and may have more appealing compensation packages.

The panelists spoke to a variety of courses and degrees offered by iSchools. Given the breadth of interests and work environments ranging from traditional to emerging specialties, the iSchools offer different concentrations, seeking to appeal to a diverse student population. Some iSchools are becoming more focused on computing, pointing as well to the growth of university programs in health informatics. Another noted shift in skill sets valued by research institutions is the emergence of research on the “science of science” or meta science, which uses large-scale data on the production of science to search for universal and domain-specific patterns. The iSchools also offer undergraduate degree programs that further questions about the value of the master’s degrees, and whether or not the skills can be attained through on-the-job training.

The iSchool panelists shared that they must constantly remake themselves in order to deliver value. In general, they seek to attract students who can be change agents, comfortable with people, information, and technology. Rather than focus on the library as place, they focus on the library as an institution with a role to play in the broader context of research and lifelong learning.



As we look to do our part to support research libraries and the broader mission of research, teaching and learning, we must pursue partnership with others. ARL can facilitate how norms and policies and future planning that can benefit all of our institutions and our field. Establishing AI policies and norms for research libraries, developing a privacy position (e.g. Stanford Libraries privacy statement), and creating programs that facilitate the development of the necessary expertise and talent will serve future research library teams.

There is a sense of urgency that research libraries must position themselves to demonstrate value and be prepared to meet the demand for new services. This requires a workforce pipeline and staff who are comfortable with delivering services in a time of continual flux, accepting change as the norm, and being part of an organizational structure that

rewards and recognizes them for doing so. Leaders must position the library and themselves to deliver value within a confluence of priorities and external pressures on institutions in higher education, and to lead collaboratively with a broad range of partners, including being prepared to cede real or perceived ownership.

## Participant Recommendations on Research Libraries as Catalytic Leaders and Next Generation Organizations, Skills, and Competencies

Fall Forum participants provided recommendations for research libraries on professional development, and in and among research libraries. Note that these are not necessarily mutually exclusive categories.

On professional development, research libraries can:

- Partner to create human capacity to use emerging technologies and support adoption of those technologies in research and learning
- Build strong understanding of and relationships with other disciplines
- Move from competencies to values-based learning

In and among research libraries, research library leaders can:

- Align with institutional priorities and translate value to the decision-makers, and other key stakeholders
- Be very clear about the nature of the work, the priorities, and forecast the workforce needs to come
- Be more visible
- Create strong partnerships within and external to the institution
- Look forward and model the change
- Facilitate a culture of learning
- Provide resources for innovation and make it safe to fail

- Create more paths to success that reflect an agile organization and the collaborative work with the broader research and learning community, and update job descriptions to represent a culture of flexibility
- Reimagine the expertise, teams, roles, and partnerships needed to deliver on the mission today and in the future
- Collect examples and share guidance on what research libraries can stop doing
- Offer a shared position bank such as the ARL Position Description Bank, <https://www.arl.org/jobs/arl-position-description-bank/>
- Maintain a job title list and updated organizational changes
- Share how institutions are framing paraprofessional positions



## Cross-Cutting Themes on the Role of the Research Library

The pressing question tested throughout the day was: Are research libraries ready, and are they being bold enough? Throughout the day, several cross-cutting themes emerged that serve as a first response. The themes represent a point in time when boundaries are dissolving within and between internal organizations and external communities, and the exponential pace of innovation presents both unfathomable opportunities and challenges. The common denominator of all the themes was the absolute need for collaboration. Specific cross-cutting themes are captured below.

Libraries have been the information bedrocks of their institutions, not

Libraries are required to steward the past, present and future. The overarching theme that emerged from all of the sessions at the Fall Forum was that we must be bold and demonstrate our institutional and cultural leadership as technology continues to revolutionize our ways of knowing and of sharing what is known.

always the trailblazers. As data, and specifically big data and what it enables, expands its potential in every dimension of our lives, the role of research libraries needs to evolve. The interests and opportunities that were shared on every topic—Catalytic Leadership, Emerging Opportunities, AI and New Forms of Reality, and Organizational Readiness—suggest that research libraries would serve society well by being both bedrocks and trailblazers now.

Research libraries are aligning their priorities with their institutional priorities: student success, demonstrating the value of education, intellectual freedom and campus inclusion, being a trusted partner in knowledge discovery and

critical thinking. The research library needs to increase its visibility in the research and learning community as a trusted partner—not only as a place—but also as an institution with experts focused on context setting.

As research library organizations evolve, there is an increasing need to align very quickly with emerging practices in research, teaching, and learning. This is complicated by the very structures that have been in place for decades, including incentives, human resource policies, and budgets that no longer meet the information needs of readers and researchers. Libraries may be one of the few institutions that are expected to steward the past, present, and future. Determining the



Photo credit: iStockphoto

The library is an institution where people have the opportunity to escape the constant digital surveillance influences our connection to information and learning. Manipulation-free curiosity is vital to an individual's discovery and development of personhood. Libraries can emphasize that value and make users aware of what they are experiencing by providing a contrast to the constant engagement and persuasion that exists in daily life.

type of library collection and services needed today in a highly networked world is fraught with policy, governance, and practice challenges. Progress is being made but there are no easy answers yet. Further complicating the evolution is the need for sustainable networked solutions. Research libraries need to decide what they can stop doing. And, libraries can do more to collaborate and lead on establishing sustainable network solutions.

The participants acknowledged that there is a significant opportunity for research libraries to add value given emerging technologies and changes in the nature of research, teaching, and learning—and even more

broadly as these changes affect societal policies, legislation, and values. Nevertheless, research libraries must be visible and proactive, leading agile organizations and creating new career paths for talented people. This is a challenge shared with professional development programs, post-secondary education institutions, and the broader human resource systems within which research libraries function.

## Next Steps

Research libraries have significant opportunities to contribute in meaningful ways in this time of constant flux. They are moving

forward. Yet, there are critical decisions still to be made in order to achieve a shared vision demonstrating value at scale—synchronously with changes in research and learning priorities.

Are research libraries ready and are they being bold enough? Research libraries are and will continue to be catalytic leaders. This is a moment to be even bolder—individually, across research libraries, in and across research institutions, and in the broader context of our society. This report highlights recommendations for research libraries in previous pages. Additionally, Fall Forum participants made specific recommendations for the Association of Research Libraries; these are listed on the following page.

## Recommendations to the Association of Research Libraries

The recommendations and the full report will be reviewed and shared with the ARL Program Strategy Committee and the Board of Directors to consider how ARL can best support research libraries and the broader mission of research, teaching, and learning. As in all of our work, the recommendations can only succeed through collaboration and partnerships—by engaging with our member institutions, the research and learning community, and public policy makers.

### Catalytic Leadership

- Set a vision for the research library as an institution, and develop frameworks or models for success
- Build human capacity to achieve that vision

### Emerging Opportunities

- Develop case studies on how to scale or replicate emerging opportunities
- Participate in collective work to ensure sustainable access to collections, both physical and digital
- Create data-citation standards

### AI and New Forms of Reality

- Establish AI policies and norms for research libraries
- Establish a privacy position (such as the Stanford Libraries patron privacy statement)

### Next Generation Organizations, Skills, and Competencies

- Create a framework for the future library organizational structure based on roles that reflect the nature of the work
- Create pathways to facilitate research library transformation in order to develop and nurture the necessary expertise and talent
- Create the capacity for use and support of emerging technologies in research and learning
- Build disciplinary relationships and deep engagement with, for example, the Association of American Universities (AAU), the Association of

Public and Land-grant Universities (APLU), scholarly societies

- Conduct surveys of members on library services
- Establish standards for rating research libraries every year
- Collect and share guidance on what research libraries can stop doing
- Maintain a job-title classification list and updated organizational charts
- Share how institutions are framing paraprofessional positions
- Offer a shared job position bank
- Cultivate stronger library leadership and management to include skills related to branding, adaptability and innovation, change management
- Provide tools to help library organizations work with staff to identify and align individual values with institutional values

We are in another epic societal shift that calls for a **“new relationship between thinking man and the sum of our knowledge.”**<sup>36</sup> As one of society’s most trusted institutions, research libraries are and can be catalytic leaders focused on changes for the good of all people.

36. Editor’s note on Vannevar Bush, “As We May Think,” *The Atlantic* (July 1945), <https://www.theatlantic.com/magazine/archive/1945/07/as-we-may-think/303881/>.

# APPENDIX

## Speakers

### Welcome

[Lorraine Haricombe](#), Vice Provost and Director of Libraries, The University of Texas at Austin, and ARL President 2019–2020

### The Fourth Industrial Revolution

[Jaron Lanier](#), Computer Scientist, Musician, Artist & Author

## Panelists

### Emerging Opportunities

Moderator: [David Leonard](#), President, Boston Public Library

#### Speakers:

[Susan Haigh](#), Executive Director, Canadian Association of Research Libraries

[Gina M. Siesing](#), Chief Information Officer and Constance A. Jones Director of Libraries, Bryn Mawr College

[Louis Soares](#), Chief Learning and Innovation Officer, American Council on Education (ACE) Center for Policy and Strategy

### AI and New Forms of Reality

Moderator: [Carl Grant](#), Interim Dean of Libraries, University of Oklahoma

#### Speakers:

[Jason Griffey](#), Director of Strategic Initiatives, NISO, and Affiliate Researcher, metaLAB, Harvard University

[Keith Webster](#), Dean of University Libraries and Director of Emerging and Integrative Media Initiatives, Carnegie Mellon University

### Organizational Readiness

Moderator: [Robert McDonald](#), Dean of University Libraries, University of Colorado Boulder

#### Speakers:

[Wendy Duff](#), Professor and Dean, University of Toronto Faculty of Information

[Vivian Lewis](#), University Librarian, McMaster University

[Eric Meyer](#), Dean of the School of Information, The University of Texas at Austin

[Denise Stephens](#), Vice Provost and University Librarian, Washington University in St. Louis

## Small-Group Discussions

**Catalytic Leaders:** [Erik Mitchell](#), Audrey Geisel University Librarian, UC San Diego

**Emerging Opportunities:** [Martha Whitehead](#), Vice President for the Harvard Library and University Librarian, and Roy E. Larsen Librarian for the Faculty of Arts and Sciences, Harvard University

**Organizational Readiness:** [Mary Case](#), University Librarian, University of Illinois at Chicago

**AI and New Forms of Reality:** [Carl Grant](#), Interim Dean of Libraries, University of Oklahoma

## Participants' Institutions

American Council on Education

American University

Association of College and Research Libraries

Association of Research Libraries

Association of University Presses

Auburn University Libraries

Baylor University

Big Ten Academic Alliance

BioOne

Boston Public Library

Boston University Libraries

Brigham Young University

Bryn Mawr College

Canadian Association of Research Libraries

Carnegie Mellon University

Coalition for Networked Information

College of Wooster

Colorado State University

Columbia University Libraries

Dartmouth College

EBSCO

ExLibris

Federal Reserve

Florida State University Libraries

Gale, a Cengage Company

George Washington University

Georgetown University Library

Georgia Institute of Technology

Hampton University

Harvard University

Indiana University Libraries  
Bloomington

infoDOCKET

Institute of Museum and Library Services

Iowa State University

Johns Hopkins University

Kent State University

Lehigh University

Liberty University

Library of Congress

McMaster University Libraries

Michigan State University Libraries

National Agricultural Library

National Endowment for the Humanities

National Library of Medicine

New York Public Library

NISO/Harvard University

Northeastern University

OCLC, Inc.

Ohio State University

Ohio University

## Participants' Institutions, continued

Pennsylvania State University  
Princeton Theological Seminary  
Simon Fraser University Library  
Slate Communication  
Smith College  
Smithsonian Libraries  
Syracuse University Library  
Temple University  
Texas Tech University  
University at Albany, SUNY, Libraries  
University at Buffalo, SUNY, Libraries  
University of Alabama  
University of Arizona Libraries  
University of Arkansas  
University of California, Davis  
University of California, Irvine Libraries  
University of California, Los Angeles  
Library  
University of California, San Diego  
Library  
University of California, Santa Barbara  
Libraries  
University of Chicago  
University of Colorado Boulder Libraries  
University of Connecticut  
University of Delaware  
University of Illinois at Chicago  
University of Illinois at Urbana-  
Champaign  
University of Iowa Libraries  
University of Kentucky  
University of Manitoba Libraries  
University of Maryland at College Park  
University of Massachusetts Amherst  
University of Miami  
University of Nebraska–Lincoln  
University of Notre Dame  
University of Oklahoma Libraries  
University of Ottawa  
University of Pennsylvania  
University of Pittsburgh Libraries  
University of Rhode Island  
University of Saskatchewan Library  
University of Texas at Austin

University of Toronto  
University of Utah Library  
University of Virginia  
University of Wisconsin–Madison  
Libraries  
Vanderbilt University  
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University of North Carolina Libraries

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Rochester Data Science Consortium  
<http://rocdatascience.com/about-rdsc/>

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Virginia Commonwealth University  
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