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Information Outlook, September/October 2019

Special Libraries Association

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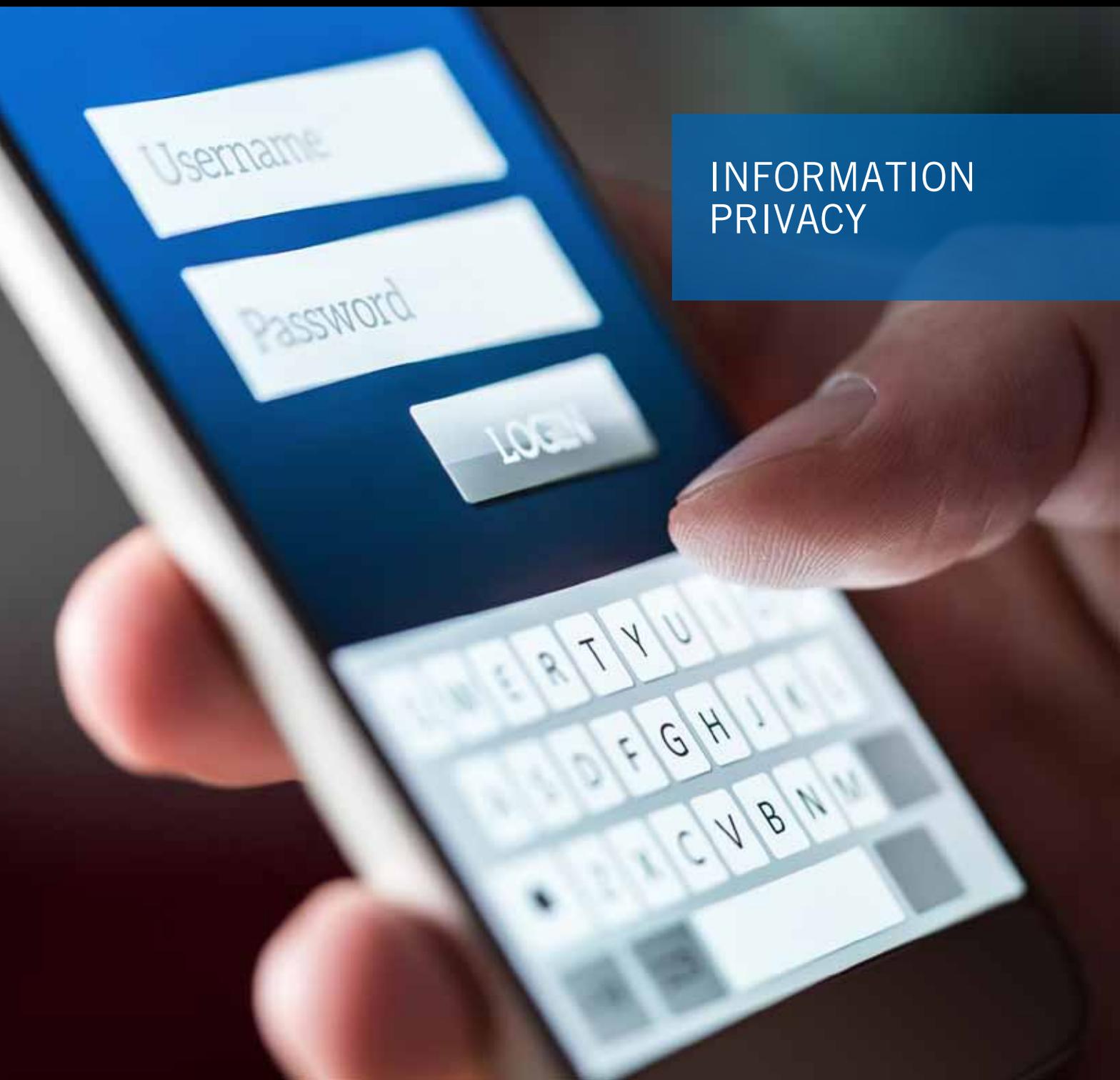
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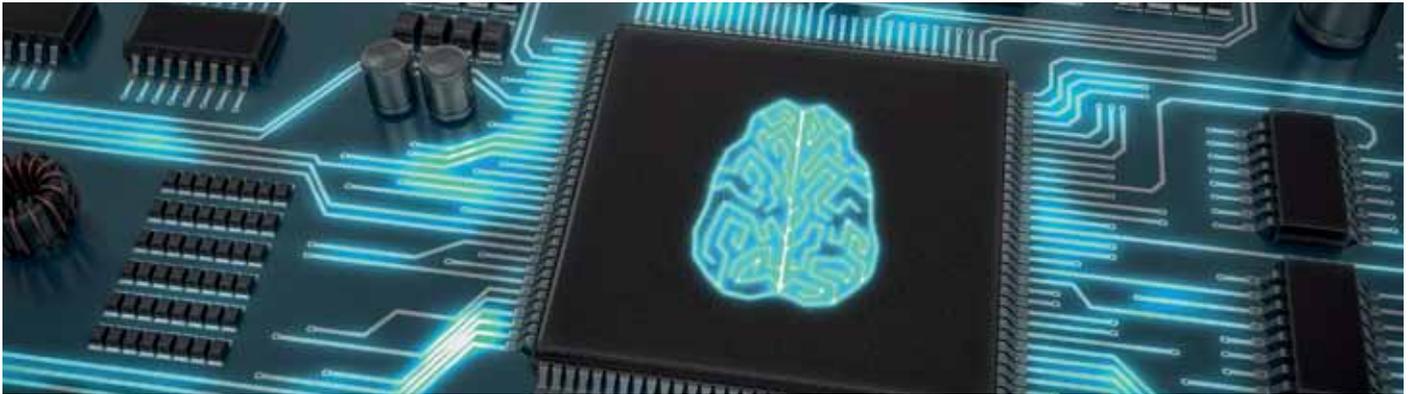
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information outlook

THE MAGAZINE OF THE SPECIAL LIBRARIES ASSOCIATION



INFORMATION
PRIVACY



THE IMPACT OF AI ON LIBRARIAN SERVICES

Artificial Intelligence has long entered our workplace and home. Collaborative robots are used to interact with humans on the factory floor, deliver parts or perform repetitive or even dangerous tasks. In our homes AI devices are found in form of robot vacuum cleaners, devices that monitor moisture levels in the garden or re-order laundry detergent.

Just like other areas of our lives, Artificial Intelligence has also entered libraries in the form of chatbots that can handle directional questions on a library website, alert when a book is due, point a user to relevant library resources or answer simple informational requests. In the future, AI will influence the way information can be connected and found in even more exciting ways. Librarians have insight into how their clients search for and use information and can therefore actively support the development. This might mean to bring a text and data mining tool to an internal dataset or help a project team find new insight from existing data. Or to acquire a data visualization tool to help users find unexpected connections in the published literature. By observing and exploring how information flows within their organization, librarians can identify points at which information could be transformed or used in entirely new ways.

Machine learning as well as sound- and image-recognition technologies are already being used to analyze digital collections and identify topics and entities, assign metadata and enable non-textual search and discovery. Librarians are working with machine learning technologies, to enhance classification schemes to improve search and recall precision. Data visualization tools such as [Springer Nature SciGraph Explorer](#) can be used to identify unexpected connections among concepts, researchers, and institutions. While in the past information professionals have been involved in building customized search engines and created LibGuides, today, librarians and other information professionals can actively participate in designing the next AI-based new knowledge discovery tools and embed their focus on enabling the best information into these new tools.

In the future AI will enable new capabilities to address library user's information needs. Libraries can use AI tools to provide not just information but deep intelligence—offering “Insight As A Service (IAAS).” Librarians can prepare for providing IAAS by identifying tools that might be relevant to their user groups. Sources such as '[Nature Machine Intelligence](#)' and the Springer Nature eBook collection '[Intelligent Technologies and Robotics](#)' offer a wide perspective on trends in artificial intelligence and related technologies.

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Information Privacy

Maintaining the privacy of certain information poses numerous challenges for librarians and information professionals, but it can also open doors to a new career path.

BY STUART HALES

In their 1890 article “The Right to Privacy” in the *Harvard Law Review*, future U.S. Supreme Court Justice Louis Brandeis and co-author Samuel Warren argued for an expansion of the legal protections afforded individuals. Noting that advancements in photography and more aggressive journalistic tactics had “invaded the sacred precincts of private and domestic life,” Brandeis and Warren urged the courts to take steps to “secur[e] to the individual ... the right ‘to be let alone.’”

In sounding the alarm over invasions of privacy by the media, Brandeis and Warren were foreshadowing today’s debates over the sharing of private information and the use of technology to identify individuals and monitor their actions. Consider just these recent news headlines:

- Privacy Advocates Raise Concerns as Delta Airlines Expands Use of Facial Scanning at Atlanta International Airport
- Millions of Americans’ Medical Images and Data Are Available on the Internet. Anyone Can Take a Peek.
- Waterfront Toronto Smart City Plans Raise Privacy Concerns

Against this backdrop, what can librarians and information professionals do to help protect the privacy of their customers? Matt Connolly, an application developer at Cornell University Library and author of the 2018 book *User Privacy: A Practical Guide for Librarians*, says the first and most important step is for the library’s or overall organization’s leaders to make user privacy a priority.

“Meaningful privacy protection begins as an institutional value,” he says. “Buy-in from the library’s administration and directors is essential for creating a coherent, unified privacy policy.”

That said, librarians and information professionals can take concrete steps to help protect the privacy of information users and their organizations. Lauren Merrill, a senior records manager at Biogen, writes in this issue of *Information Outlook* that developing and adhering to a records retention schedule and conducting periodic record reviews can help organizations protect the privacy of their customers, workers and other stakeholders as well as their trade secrets.

“As the information professional, you can help align the records that have been reviewed with their record type

and associated retention period,” she writes. “Inevitably, you’ll hear concerns from colleagues about needing to keep a copy, or that you shouldn’t get rid of a record because it ‘might be needed someday.’ On the flip side, these reviews also provide you with opportunities to explain the risks your organization can incur by holding onto records beyond their retention periods.”

Stephanie Davis, a manager in Deloitte’s cyber risk practice in Toronto, became so interested in information security and controlling access to personal information that she moved from knowledge management into the field of privacy. Although privacy often is considered the domain of attorneys, Stephanie says that librarians who value protecting personal information can create a career for themselves in the privacy field.

“The CIA triad (confidentiality-integrity-availability) that is fundamental in the information security profession parallels a basic information management (IM) tenet—getting the right information to the right person at the right time,” she writes in her article. “Similar to IM professionals, those in security facilitate data accuracy through the application of controls and establish tools to provide timely and adequate retention and destruction of information. Privacy, in many ways, is a combination of IM and information security, but with some twists.”

Privacy is also a topic discussed in the SLA member interview with Mallory Blasingame and Jing Su, information scientists at the Vanderbilt University Medical Center and co-authors (in part) of the best contributed paper presented at the SLA 2019 Annual Conference. Both work with information and records protected by the 1996 Health Information Portability and Accountability Act (HIPAA), landmark

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Converging Paths: A Librarian's Journey to Becoming a Privacy Professional

INFORMATION PROFESSIONALS HELP ENSURE INFORMATION SECURITY, WHILE PRIVACY FOCUSES ON MANAGING AND SECURING PERSONAL INFORMATION. THIS OVERLAP PROVIDES A PATH TO MOVE FROM ONE FIELD TO THE OTHER.

BY STEPHANIE DAVIS, MA, MLIS

I love to tell people I am a librarian.¹ The title is endearing, instantly comforting and just plain badass. It implies that I possess an array of knowledge, inherent organizational skills, and a service-oriented attitude—all of which I strive to use and deliver on a daily basis. That said, my job description has taken a different direction from what I was trained to do in library school, although the skills I learned there have provided me with a foundation for becoming the privacy professional I am today.

My journey has not been a traditional one, but I'm proud of this because it means I can bring a diverse perspective to the profession. I fell in love with books as a child (and still love them today), so I focused much of my energy

on the interpretation of stories. This led me to earn a bachelor's degree in English and history, then a master of arts specializing in medieval literature. I love reading about others' perspectives and trying to understand their paths.

I also enjoy researching and trying to uncover information to form new ideas and develop insights. Earning my master's degree in library and information studies² taught me that using metadata, establishing a well-defined taxonomy, and efficiently organizing and retaining information makes it possible to do these things effectively.

After receiving my MLIS, I began working in the field of knowledge management (KM), where I sourced, documented, categorized, and shared information about my consulting firm's peo-

ple and project experiences. I designed webpages, delivered training programs on information access and disclosure, and administered communications and awareness campaigns. I also tracked metrics and presented reports to senior management to demonstrate the KM program was delivering against our strategy and mandate.

During this process, I handled some data that required cleansing to remove sensitive attributes prior to distribution. I also designed information repositories that required well-defined access provisions. I became interested in keeping data secure and maintaining confidentiality while also focusing on how to make information as accessible as possible so my clients could achieve their objectives.



STEPHANIE DAVIS is a manager in Deloitte's cyber risk practice in Toronto, where she helps organizations develop and operationalize privacy, data protection, and data governance programs. She has specialized skills in classification, communications, and knowledge management, which she applies to the delivery of effective data-sharing processes and platforms. Contact her at stephadavis@deloitte.ca.

Information Security

Of course, information professionals have always played a major role in ensuring information security. The CIA triad (confidentiality-integrity-availability) that is fundamental in the information security profession³ parallels a basic information management (IM) tenet—getting the right information to the right person at the right time.⁴

I would argue that many in security tend to focus on the “right person” part of the paradigm. That said, security is a multifaceted role, and when it comes to business continuity, we know how important access becomes. Similar to IM professionals, those in security facilitate data accuracy through the application of controls and establish tools to provide timely and adequate retention and destruction of information. Given these parallels, it was relatively straightforward for me to enter the field of security.

Security is also about protecting information to prevent loss, misuse or unauthorized access. Strong security enables privacy by securing the systems, networks and even physical repositories where sensitive data resides. Security also binds a user’s identity to their behavior to enable monitoring for the appropriate use of data.⁵ The world of privacy, while similar to security to the extent that the CIA triad still applies, has some big differences that must be taken into account.

Privacy Basics

Let’s talk basics. First, privacy is all about appropriately managing a certain type of information, specifically information about an identifiable individual,⁶ also known as personal information (PI).⁷ Similar to the field of information management, a privacy professional is concerned with managing PI across the information life cycle, from collection, access, use and storage to sharing/disclosure, archiving and destruction. Specifically, privacy professionals focus on governing PI to make sure that it is—

- collected appropriately from the source;

Speaking of lawyers, there is a longstanding myth that you need to be a lawyer to work in the privacy profession. This is not the case, but you do need to have a solid understanding of privacy legislation to work in the field.

- accurate or of the right quality;
- accessible only to those who are authorized to use it;
- used only in ways that it was intended;
- safeguarded adequately; and
- retained only as long as required or in compliance with legislative obligations.

Privacy, in many ways, is a combination of IM and information security, but with some twists.

Diving deeper, the biggest difference stems from the data and the idea of control and ownership over that data. Personal Information is not the same as other organizational data because it does not fundamentally belong to the organization; rather, the organization is a custodian of that information and can only collect, use and share it if it has the authority to do so. This authority is usually granted only after consent is received from the subject of the information, although not always (e.g., consent is waived for criminal investigative purposes). Privacy professionals will ensure that the appropriate notice is given and/or consent received from individuals prior to or during collection, and the use, disclosure and retention of PI is limited only to what is agreed upon.

Privacy Requirements for Organizations

Beyond this, organizations are bound by privacy regulatory requirements, which differ depending on the nature of the data (e.g., personal health information) and the jurisdiction in which the data/data subject resides (e.g., California vs. Florida or Canada vs. Europe). This means that organizations have varying obligations regarding how they handle and protect PI, such as the following:

- the obligation to have a data protection officer (DPO);
- the requirement to complete a Data Protection Impact Assessment (DPIA) for all new or changed uses of the data;
- timing requirements for breach notification to a privacy commissioner; and
- limits on what the organization can disclose to organizations in other jurisdictions.

The regulatory requirements vary depending on the privacy laws that affect the organization. This is why many of my privacy colleagues are lawyers—they assist organizations in interpreting the legislative privacy requirements.

Speaking of lawyers, there is a longstanding myth that you need to be a lawyer to work in the privacy profession.

This is not the case, but you do need to have a solid understanding of privacy legislation to work in the field. It's been my experience that it is beneficial to always work closely with lawyers when defining contractual clauses and developing online privacy notices.

However, an effective privacy program takes more than legislative compliance. A mandate, terms of reference, and a strategy must be defined to guide the program. Policies and procedures, along with training and communications, must be established to enable leaders/employees to understand their privacy obligations. There are operational activities to perform, such as providing individuals with access to their PI, undertaking Privacy Engineering and Privacy Impact Assessments (PIAs) to ensure that PI is safeguarded (more on this later), and conducting privacy breach response planning.

Privacy risk management activities should also be conducted to ensure the program is operating effectively, using vehicles such as privacy program audits. It is also essential to monitor privacy metrics and conduct ongoing reporting. You need not be a lawyer to do this successfully; it takes some solid relationship building and collaboration with leaders from across the organization, strong communication skills, and the ability to solve problems.

The Complex Data and Digital Landscape

I do not want to understate the complexity involved. We live and work in a world where the use of data and digital platforms is changing rapidly. Privacy professionals are essential to making sure PI is used in the right way, for the right purpose, and with the right level of consent.

Here's a quick snapshot of some of the complex challenges involved:

- Data is moving to cloud environments that are managed by third-party cloud service providers.
- Organizations are using black box technology (or artificial intelligence)
- Data lakes are the new normal when it comes to employees accessing and manipulating massive datasets.
- Organizations are sharing data with multiple third parties.
- Organizations are selling and commercializing the data in their possession.

for automated decision-making.

There is a lot on the go here, especially with a shifting regulatory environment, growing public fears of privacy breaches, and increasing demands for more transparency and accountability. The good news is that the regulations and public emphasis on privacy are helping privacy professionals do our job, but let's be clear—it's a full-time job.

Privacy professionals must keep current with what's happening in this digital revolution. They need to know what the law requires. They must embed "privacy by design" into all processes and establish the right level of controls and safeguards.⁸ They must ensure this is done correctly.

I compare the privacy professional to a medieval knight, continually honing a multifaceted skill set. We are one of the best lines of defense for an organization, upholding a fundamental set of societal values while serving and protecting those who have entrusted us with their data.

I will always be a librarian and strive to uphold all the values that title implies. At the same time, I want to continue in the role of a privacy professional and be instrumental in finding ways to protect the personal information and essential rights of individuals in our society. I encourage librarians and information professionals who share these goals to consider a career in the privacy field. **SLA**

NOTES

1 The terms *librarian* and *information professional* and the fields of librarianship and information management are used interchangeably here, although I am sure some may disagree with this.

2 Recently, my alma mater changed the name of this degree to master of information, and the profession seems to be moving more in this direction.

3 The exact origins of the term *CIA triad* appear to be unknown.

4 This term spans many disciplines, although it seems to be foundational to the information management profession. For more information, see Howarth, L.C., 2018, "Stepping Out: Organizing Information in the 21st Century," in Matarazzo, J.M., and T. Pearlstein (Eds.), *The Emerald Handbook of Modern Information Management*, Bingley, U.K.: Emerald Publishing Ltd.

5 From Deloitte Canada, 2019, "Cracking the Code: Cyber Risk Services Fundamentals" (course materials).

6 As defined in Personal Information Protection and Electronic Documents Act, SC 2000, c 5, (<http://canlii.ca/t/541b8>).

7 *Personal information (PI)* is the term used in Canadian privacy legislation, *personally identifiable information (PII)* is the term used in American privacy legislation, and *personal data* is used in European privacy legislation (among other jurisdictions), although the terms are often used interchangeably.

8 There's not enough room for all the citations that privacy engineering and privacy by design deserve. I suggest doing personal research on these topics.

Organizational Considerations for Retaining and Disposing of Records

HAVING POLICIES AND PROCESSES IN PLACE TO MANAGE AND DISPOSE OF RECORDS CAN HELP YOUR ORGANIZATION AVOID LEGAL RISKS AND PROTECT INDIVIDUAL PRIVACY.

BY LAUREN MERRILL, MS

“... But I might need it someday ...”

Not only is this phrase something I say to myself when cleaning out cabinets and drawers at home, it's also something I hear frequently from my business colleagues when talking to them about records retention and disposition. As information professionals, one of the most important things we can do is ensure that our organization has—and adheres to—a records retention schedule. Given the current global focus on privacy and security, organizations can (and should) take comfort in knowing they are protected by their records retention schedule.

To build that level of comfort, you must ensure your organization's records retention schedule agrees with the

requirements established by the governing authorities where you do business. Records retention timelines are not universal, and what holds true for the United States is not always the same in, say, the European Union or Japan.

Given these regional differences, business decisions need to be made and documented about the retention policies you are applying to your organization's record types. For organizations that operate globally, this can mean having to choose one retention period over another. Your legal department can be a great resource for ensuring you are adhering to the applicable regulatory requirements and maintaining a defensible position if you must retain

records beyond one country's requirements in order to fulfill the regulations of another.

Remember that your records retention schedule should be reviewed regularly to ensure it includes any regional updates to retention periods. This is especially true if your organization operates in a regulated space, as changing laws and regulations may affect records retention requirements. As part of the procedures for maintaining your records retention schedule, you must establish a process to monitor for updates and feed that information forward into your schedule. The updates might not be applicable, or they could still be shorter than the retention periods in your existing schedule, but you need to reflect



LAUREN MERRILL is an experienced records and information management professional with more than 14 years in the biopharma industry. She has spent her career focusing on records management in a GXP-regulated environment, helping balance regulations and business needs. She is currently a senior manager in records management at Biogen and can be reached at lauren.merrill@biogen.com.

those checks and balances in your decision-making process.

Once you have in place a records retention schedule and process for maintaining that schedule, formulate a policy that your organization can follow. This policy should clearly outline the life cycle of a record and highlight accountability for records disposition across your organization.

Records Life Cycles

In the current electronic records environment, where records are created in an instant and it feels as though we have unlimited storage space, we need to remind our colleagues that our records are not meant to last forever. Every record has a life cycle, and it's worth framing records retention decisions on this basis. An organization creates records, maintains records, archives records (as appropriate), and decides the disposition of records.

Having a framework and policy in place enables our colleagues to manage their records appropriately and provides us with tools we can use to encourage departments to take ownership of their records beyond just storing them safely. As information professionals, we need to be the stewards of these activities across our organizations, setting the example and providing best practices. We can start by establishing a process for records review: asking our departments to regularly review their records (at least annually), documenting that review, resolving any issues discovered, and recording any decisions made about records retention.

Recognize that your colleagues still have their day jobs to perform, so a records review will not be their top priority. Building support from your organization's senior leadership can help alleviate some of that apathy. Plan a company-wide Records Review Day, where you can schedule activities and encourage everyone in your organization to start looking at their records.

When talking with your colleagues about records management, stress that the departments are the subject matter

experts when it comes to their records and how they're used. Those departments, working in conjunction with your organization's information professionals, can make the most appropriate decisions about their records with respect to records retention and disposition.

Building relationships with the departments and establishing these processes is important. Quite often, just a little bit of hand-holding can yield tremendous results when departments embark on records retention and disposition activities. Perhaps this is because they know whom to contact with questions, or because they feel more comfortable knowing someone is asking them directly to review their records. Either way, with a records review in hand, it becomes easier to talk about destroying records within your organization.

As the information professional, you can help align the records that have been reviewed with their record type and associated retention period. Inevitably, you'll hear concerns from colleagues about needing to keep a copy, or that you shouldn't get rid of a record because it "might be needed someday." In fact, one of the most valuable takeaways from these interactions is that you have a firsthand opportunity to recognize how hard and unnerving it can be for your colleagues to get rid of their records. On the flip side, these reviews also provide you with opportunities to explain the risks your organization can incur by holding onto records beyond their retention periods. The reviews also offer an opportunity for you to reconfirm how a particular record or set of records has been categorized and provide a little education about the retention schedule.

It should be noted that records disposition involves more than just evaluating whether it is time to destroy records. Frequently, when someone refers to disposition, they are discussing records that have met their retention limit and are scheduled to be destroyed, but disposition can also mean evaluating how frequently the records are used and whether they can be transitioned

to an archive. In the case of electronic records on physical media (hard drives, USB drives, CDs/DVDs, etc.), it can also mean making the decision to migrate the records to a new physical medium to ensure the records will be available for the duration of their retention period. All of these considerations enable us to safeguard our records.

More Risk than Benefit

As we think about retention periods, we should keep in mind that there are several reasons not to maintain records beyond their retention period. First and foremost is to demonstrate that your organization has a strong and defensible records retention policy that you follow. If you're only getting rid of some records once they meet their retention period without creating a strong business case for the exceptions, you run the risk of calling into question your motives for only destroying some of the records. Second—and I'm sure you've heard this from your legal department before—a record kept beyond its retention period remains discoverable. Whether or not it has met its retention period, a record that is not destroyed must be produced during any discovery or litigation activities.

This can be a key talking point with colleagues—holding onto records beyond their life cycle can lead to more risk than benefit. Additionally, if we hold onto our records, they not only remain discoverable, they clutter up our records environments. This clutter makes it hard for individuals in your organization to find what they're looking for, potentially costing significant time, money, and potential re-work. We should also consider our company's infrastructure as another reason not to keep records beyond their retention period. Adhering to your organization's retention schedule de-clutters your record storage environments, creating valuable space on the shelves or the server.

Whether the topic at hand is record

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Consumer Genetic Tests and Privacy: What Librarians Should Know

GENETIC DATA, LIKE MUCH OTHER PERSONAL INFORMATION, SHOULD BE SAFEGUARDED FROM SHARING WITH THIRD PARTIES UNLESS CONSENT IS FREELY AND KNOWINGLY GIVEN.

BY JOHN VERDI

More than 26 million people have used consumer genetic tests to learn about their ancestry, connect with family members, and identify health risks. Reviewing the results can be fun or informative. Some tests even predict what types of wine best fit your DNA test profile (<https://www.businessinsider.com/vinome-wine-dna-test-2017-8>) or generate a playlist of songs that reflect your genetic ancestry (<https://qz.com/quartz/1399279/spotify-can-use-your-ancestry-dna-test-to-tell-your-musical-dna/>).

This article explores what librarians and information managers should know about the privacy implications of consumer genetic tests. It turns out that while many companies offering these

tests have signed on to voluntary privacy principles, others are much more aggressive in sharing their users' genetic information.

Genetic data is one of the most sensitive categories of personal information. It may be used to identify risks regarding future medical conditions, contain unexpected information (https://www.washingtonpost.com/local/social-issues/they-considered-themselves-white-but-dna-tests-told-a-more-complex-story/2018/02/06/16215d1a-e181-11e7-8679-a9728984779c_story.html) that could be unsettling, or reveal sensitive information about the test taker's family members. Recent research (<https://science.sciencemag.org/content/362/6415/690>) indicates that Americans of European descent can be identified by their DNA 60

percent of the time if a relative is in a genetic database.

Companies in the consumer genetic testing space are well aware of the sensitive nature of the information in their care. That is why industry leaders worked with the Future of Privacy Forum (FPF) in 2018 to develop privacy and data principles that both privacy advocates and the personal genomics industry can embrace. FPF and privacy experts at the companies incorporated input from the Federal Trade Commission, a wide variety of genetics experts, and privacy and consumer advocates.

FPF's Privacy Best Practices for Consumer Genetic Testing Services (<https://fpf.org/2018/07/31/privacy-best-practices-for-consumer-genetic-testing-services/>) establish standards for the collection, use and sharing of consumer genetic test data. These standards require the following:

- **Transparency** about how genetic data is collected, used, shared, and retained. Companies that abide by the best practices post a high-level summary of key privacy protections that is easily accessible to consumers.

JOHN VERDI is vice president of policy at the Future of Privacy Forum, a nonprofit organization that serves as a catalyst for privacy leadership and scholarship and advances principled data practices in support of emerging technologies. He can be reached at jverdi@fpf.org.



- **Separate express consent** before any transfer of genetic data to third parties. Companies should never share individual-level genetic information with third parties, particularly with insurers, employers, or educational institutions, without consent or as required by law.
- **Educational resources** about the risks, benefits, and limitations of genetic testing.
- **Access, correction, and deletion rights.** For example, companies should be clear about their retention practices and offer prominent ways to delete genetic data or direct the company to destroy individuals' biological samples.
- **A valid legal process** before the disclosure of genetic data to law enforcement. Companies should require that government entities obtain a court order before they disclose genetic data, and they should report on their disclosure practices at least annually.
- **Restrictions on marketing** based on genetic data. Companies should not market based on genetic test results unless there is an explicit opt-in to that type of marketing.
- **Robust data security protections** and privacy by design.

Strong and transparent industry-wide guidelines provide people with confidence that companies in this growing field will protect their privacy. These best practices are essential to engendering trust in this nascent business sector.

Access to Genetic Profiles

But best practices are meaningless if they are not followed by their signatories. Earlier this year, FPF dropped one company that had signed on to support the privacy best practices because its actions did not align with its promises. Houston-based DNA testing company FamilyTreeDNA struck a secret deal with the FBI permitting the agency to

search for matches between the company's database of genetic information and DNA collected from crime scenes. Users who had uploaded their genetic data to FamilyTreeDNA were surprised to learn that the company permits the FBI to search for matches without a warrant.

When used appropriately, technology can provide substantial benefits to law enforcement agencies, victims, and society. Genetic testing of crime scene DNA evidence—a technique utilized by police since the 1980s—can be a powerful tool to catch criminals and exonerate innocent suspects. But crime scene forensics are fallible, and giving police access to genetic profiles can put innocent individuals (and their relatives) in the crosshairs of a criminal investigation.

Powerful tools require powerful safeguards, which is why leading genetics companies like 23andMe, Ancestry, Helix, Habit, and others worked with the Future of Privacy Forum to publicly endorse the privacy best practices, including the practice that genetic data should not be disclosed to government agencies without a warrant. These companies take legal and technical measures to prevent police from accessing consumers' DNA profiles without legal process.

Warrant requirements are a long-standing mechanism for solving crimes and protecting privacy. Warrants are issued based on evidence, and they typically target a specific person when a criminal predicate exists. The warrant process allows a neutral judge to determine whether there is probable cause to suspect that a particular individual is linked to a crime. These protections help prevent individuals from being erroneously swept up in criminal investigations.

Warrant protections are important safeguards, especially with regard to crime scene forensics. DNA analysis and other forensic techniques can erroneously identify innocent people. Experts agree that DNA matches, absent other evidence, are insufficient to prove an individual's guilt. DNA

samples may be misidentified, damaged through exposure to moisture or extreme temperatures, or contaminated with other DNA.

For example, between 1993 and 2009, European police searched for a serial criminal who was linked to six murders and numerous robberies through crime scene DNA. The search ended when officials discovered that the genetic information linking the cases matched an innocent Bavarian woman. She had not committed a crime, but instead worked in a factory that produced cotton swabs used for DNA sample collection.

FamilyTreeDNA's sharing of its users' genetic data raises substantial privacy and civil liberty concerns for individuals and their relatives. Users who contribute their DNA data for law enforcement scanning aren't simply providing their own information—DNA samples can implicate anyone in a person's genetic family tree, from close relatives to people they have never met.

Some states have wisely restricted or banned the type of familial matching technique that could be employed by the FBI in DNA databases. These rules help prevent individuals from becoming "genetic informants" by subjecting their relatives to unwanted government scrutiny, but they have not been implemented in all states.

Librarians and information professionals, especially those who manage and share health care and legal information, can suggest to individuals that they think long and hard about the consequences (both for themselves and their relatives) before they upload their DNA information to any entity that does not have explicit policies against sharing it with law enforcement. DNA is extraordinarily revealing and persistent. Its use should demand the utmost caution. **SLA**

10 Questions: Mallory Blasingame and Jing Su

THE CO-PRESENTERS OF THE BEST CONTRIBUTED PAPER AT THE SLA 2019 ANNUAL CONFERENCE CAME TO THEIR ROLES BY VERY DIFFERENT PATHS, BUT SHARE A CONVICTION THAT THEIR WORK HELPS IMPROVE THE QUALITY OF DECISION MAKING AT THEIR HOSPITAL.

BY STUART HALES

One majored in English at an American university, the other practiced medicine in China. Their career trajectories, seemingly pointed in different directions, ultimately brought them together—both are now earning their library science degrees and working at the Vanderbilt University Medical Center in Nashville, Tennessee. And earlier this year, both traveled to Cleveland to attend the SLA 2019 Annual Conference and present a contributed paper.

That paper, “Bench to Bedside: Detailing the Catalytic Roles of Fully Integrated Information Scientists,” was judged the best contributed paper presented at SLA 2019, earning Mallory Blasingame and Jing Su free registration to the SLA 2020 Annual Conference next year.

Information Outlook spoke to Mallory

and Jing about their decisions to become librarians (“information scientists,” as they are known at the Medical Center), their paper, their roles, and how SLA helps them stay current in the field of medical librarianship.

You two are the co-authors—well, you and several of your co-workers at the Vanderbilt University Medical Center—of “Bench to Bedside: Detailing the Catalytic Roles of Fully Integrated Information Scientists,” which was judged the best contributed paper presented at the SLA 2019 Annual Conference. For the benefit of those who haven’t read the paper, can you share a high-level summary?

Mallory: The paper describes the different roles the Center for Knowledge Management helps fulfill in meeting the goals of the Vanderbilt University

Medical Center. In the paper, we talk about how our vice president for knowledge management, Dr. Nunzia Giuse, maps our skills intelligently to the Medical Center’s priorities and has been able to really get us integrated into key areas where our skills align and are most valuable.

We also talk in the paper about the history of how Dr. Giuse established that integration and provide examples from “bench to bedside”—from the clinical practice setting, where we’re able to help answer clinical and operational questions and untangle clinical systems metadata, over to the research side, where we’re also very active. And we give some specific examples of projects we’ve worked on in those different areas.

What was the impetus or motivation for writing the paper?

Mallory: We really wanted to share what we do at the VUMC Center for Knowledge Management, and not only what we do, but how we do it. The CKM’s mandate is to help manage, organize, and reuse the knowledge that’s produced at the Medical Center, and we’re really involved in a range of areas in which that function is needed.

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Mallory Blasingame



Jing Su

We wanted to share this with the information science community. Also, the idea of how we strategically align with the Medical Center—we thought that would be helpful to share with other institutions, since it could be applicable to a lot of different contexts.

As I mentioned in our presentation, in April 2016, Knowledge Management became a center under the umbrella of the Medical Center, detaching from the Eskin Biomedical Library (which then rejoined main campus libraries under the umbrella of Vanderbilt University). Once established, the CKM's focus was more sharply defined as aiding the Medical Center with its knowledge management challenges. The examples in our paper detail the many projects the CKM is currently undertaking as an expression of how, through our librarian skills, knowledge management can actively contribute to a big organization such as VUMC.

You're both working toward your master's degree in library science. How well do you think your education and training thus far have prepared you for these "catalytic roles" you describe in the paper?

Mallory: All of us, when we arrive here, go through some pretty intensive

training from our colleagues. This is how Dr. Giuse has always managed the hiring of new information scientists. We get a good, strong background in areas such as searching and appraising the literature, knowledge management, medical terminology and biomedical concepts, and a lot of other areas. So that has really helped us prepare for these roles.

Also, we are constantly learning from our colleagues and engaging in professional development activities like going to SLA conferences and learning more. So we really do have a culture of learning here.

Since Jing and I are both currently working on our master's in information science, we're kind of learning the formal, foundational, educational piece alongside of being in these roles. So that's been really interesting to have that complement—to fill in some of the lingo and theory alongside the very practical and useful skills we've learned through the training program here.

Jing: I received my medical degree and practiced medicine in China. Also, during my fellowship at the CKM, I received an intense, comprehensive training focusing on developing database searching skills, exposure to a wide range of medical and scientific

information resources, and responding to complex queries from physicians. All these experiences prepared me for our work in evidence-based clinical support and other clinical librarian tasks.

Mallory: Yes, Jing's medical background has been extremely valuable, not only for the clinical insight she brings to projects but also from a training perspective, because we've been able to learn from her and from some of our other colleagues who have degrees in areas such as biochemistry and neuroscience.

Speaking of information scientists (the term you used in your paper), when and why did each of you decide to become one?

Mallory: My educational background is in English, but I came into the field of information science when I started here at Vanderbilt. I was really just drawn to the idea of knowledge management and being in a dynamic, fast-paced environment of medicine that we have here, where knowledge is always evolving and new research is always coming out and we have different ways of staying on top of it and managing it so it can be used and re-used.

That's something I've realized since I've been doing this work—that I've

always loved it and been interested in it, but I never really made the connection to information science until I came here. So that really made we want to pursue the degree and get that foundational education. Also, I wanted to get that calling card of being able to say I'm a librarian and an information scientist.

Jing: I started working at Vanderbilt as a fellow in 2014. Our director, Dr. Giuse, thought I could make use of my medical knowledge as an information scientist. After going through the intensive training, I found it satisfying to be able to help clinicians find health care information and support medical center evidence-based services. That's why I decided to become an information scientist.

Mallory, you mentioned that you majored in English, and now you're working in a medical setting. What has most interested and surprised you about working in this environment?

Mallory: I don't know that I'm surprised; I'm more like impressed. It's just really rewarding to be somewhere where everyone, no matter what role they're in—doctor, information scientist, HR—is committed to the common values and mission of making the patient's life better and doing the best thing we absolutely can for the patient. And seeing how information science can connect to that value in a really direct way—like what Jing was talking about, being able to answer a question for a clinician or being able to synthesize that information in a way that someone can take it and actually act on it—has been really exciting and really something that has been energizing for me working in this area. I didn't know, coming in, how much that would be the case.

Information privacy is a significant concern in the health care field, and also the topic of this issue of *Information Outlook*. Is it an issue in your day-to-day work, and what precautions do you take to ensure information and records privacy?

Understanding what questions can be answered by artificial intelligence and how to best ensure that what's coming out is accurate and not biased is critical, as we heard at SLA 2019 in the presentation from Safiya Noble.

Mallory: Working in a medical center, HIPAA [the Health Information Portability and Accountability Act of 1996] is extremely important. We all get training in HIPAA that we update regularly, and we all have to sign privacy agreements and things of that nature.

We do sometimes, in our work, come into contact with patient information. For instance, when we're answering a question for a clinician, we sometimes get specific information about the patient case through the electronic health record. And we've had training and gotten the appropriate permissions to do that. But then we're always careful to keep it to ourselves only, using it only to the extent that we need to find the most targeted information that can help that provider and address that specific patient's situation.

We always take this very seriously; we know our jobs are on the line if we don't handle it correctly. So, again, going back to that value of the patient, we always want to ensure that we're protecting the information and upholding our responsibilities.

Jing: Keeping patient privacy confidential is the most important thing we need to uphold. We've gotten training in this aspect and are required to sign privacy agreements and be strictly in compliance with HIPAA.

There's been plenty of talk lately about technologies such as artificial intelligence and robotics and how they might replace workers in the future. What kinds of new technologies are entering the health care field, and how have they

affected your roles (if at all)?

Mallory: Jing and I have been talking lately about artificial intelligence in particular, and Dr. Giuse, our director, is an informatics professor, so we see a lot of that research happening. There's certainly a lot of discussion and research and evaluation going on with that right now and how it can serve health care most appropriately.

In terms of actual implementation so far, Jing was telling me recently that, from her reading, it's been mostly objective data—for example, looking at imaging—that has been most advanced in terms of being able to use it. There are other areas where it's being tested, but it's a little bit more difficult to ensure that the information coming out is accurate. Understanding what questions can be answered by artificial intelligence and how to best ensure that what's coming out is accurate and not biased is critical, as we heard at SLA 2019 in the presentation from Safiya Noble about her book, *Algorithms of Oppression*.

I think that, in the coming years, we'll definitely be seeing more of this. I'm not sure what form it will take, but I think in terms of our roles, our emphasis has been on providing information that can't easily be found. I think that will keep being our focus and maybe even become more of a focus. Maybe artificial intelligence can provide some answers, but what remains is the information that still requires humans to go in and really understand the specific factors of a specific case and pull together that

information in an intelligent way.

So I think it will be interesting to see how those different elements work together.

How do you stay abreast of advances in health and medical librarianship, and how does SLA help you in this regard?

Mallory: Like any good information professionals, we look at the literature and try to follow certain journals. We're lucky to work in an environment where professional development is really encouraged, in ways that can help us better hone our skills to meet the assignments we have. So we take advantage of that. And right now we're both in school, so that's a great way to keep abreast as well.

And we just try to keep current by following alerts. On Twitter there's a hashtag, Medlibs, that I look at sometimes. Another example is PubMed, which is a heavily used database in our field—it's coming out with a new interface and other changes soon. And we've been watching that very closely and making sure we're getting those alerts, as well as practicing using the new PubMed interface so we are ready when the transition happens.

We're both relatively new to SLA—we just joined about a year ago—but we really enjoyed going to the conference in Cleveland and getting insights and perspectives from other fields. The session on gray literature searching was really helpful in terms of gaining new strategies to search for things that may not be formally published. It's something I've already been able to use.

Speaking of SLA, when and why did you join SLA, and what do you get out of

being a member?

Mallory: At the Center for Knowledge Management, we think of ourselves as a kind of special information services team, so SLA felt like a good fit. Also, our colleagues told us that SLA is a great organization and their conferences are really good, so we thought it would be a great place to start in the profession.

As I said, the Cleveland conference was really great. I'm looking forward to some of the "Best of SLA 2019" sessions and catching up on what I missed.

Just having exposure to all different types of information science in all different areas has been really interesting to see in the short time I've been a member, and how applicable different facets are across all those different settings.

Jing: I joined SLA last year. Both my colleagues and MSIS classmates recommended that it was worth being an SLA member. Also, the 2019 SLA conference was really good. I benefited a lot from it.

What do you do in your down time when you aren't "librarianing" at VUMC?

Jing: I'm taking two courses this semester, so I spend most of my spare time studying. Other than that, I spend time with my family.

Mallory: It's similar for me. I have classes and a three-year-old and a dog, so there's a lot of running around trying to keep them from getting into each other's business. I love to read, too—I know that's not shocking coming from a librarian! So that's how I spend a lot of my down time, when I can get it. **SLA**

Organizational Considerations for Retaining and Disposing of Records

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reviews or disposition decisions, what should be clear is that no one department or function should operate in a bubble. Retention periods are not the only reason we might need to retain a record. Even if a record has met its retention limit, your legal department needs to weigh in on any record destruction requests. The records could be on a legal hold, as there might be pending or ongoing litigation that requires your organization to keep its records beyond their retention period. Additionally, as we consider many new privacy regulations, there may be a need to get rid of your records sooner or, at a bare minimum, treat them differently (more securely) if they have personally identifiable information (PII).

At the end of the day, regardless of whether our colleagues would like to hold onto their records indefinitely, it is our responsibility as information professionals to have a records retention and disposition policy in place and ensure that our organization is following that policy. Not doing so creates risks for our organization. **SLA**



Bench to Bedside: Detailing the Catalytic Roles of Fully Integrated Information Scientists

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Abstract

Timely access to information in a streamlined, synthesized, and comprehensive format is critical to the success of the transformative programs and learning health systems that characterize Vanderbilt University Medical Center (VUMC). To meet this need, highly-trained information professionals created an infrastructure support framework, based on years of successful evidence interventions, that helps move discoveries from bench to bedside. As clinical programs and practices are regularly evaluated at the institutional level, a team of information experts, each participating actively in projects throughout the medical center, helps document institutional decisions and supports them with both internal and external research data. An archival system supports the maintenance and scalability of this effort through intelligent reminders and, when feasible, work assignments.

With the drive to achieve precision medicine-based care, defined by the National Institutes of Health as an approach accounting for individual genetic, environmental, and lifestyle factors, information professionals need to continually enhance their cadre of skills and competencies. At VUMC, information scientists are engaged in efforts to advance healthcare research; these efforts span from drug repurposing projects that require applying advanced, ever-changing subject knowledge to mine data from genetic, protein, and structural resources, to population health initiatives that necessitate understanding of public health, epidemiology, social determinants of health, and healthcare disparities. The institution's commitment to discovery is coupled with the need to contain costs while improving care. Information scientists ensure resources are properly channeled to current effective care practices by regularly appending and substantiating evidence to decisions undergoing process review. Data is collected on an ongoing basis for formal and informal evaluations, both for purposes of process refinement and for effective communication to leadership on return on investment.

Background

Information scientists at the Center for Knowledge Management (CKM) have become increasingly integrated into the bench to bedside cycle at Vanderbilt University Medical Center (VUMC). A history of successful and meaningful contributions has enhanced and proven the value of our skills and established our reputation as valuable members of multidisciplinary teams. Through leadership from Dr. Nunzia B. Giuse, Vice President for Knowledge Management and tenured Professor of Biomedical Informatics, CKM has gained unique opportunities to link the group's skills to a variety of medical center research efforts.

The center's projects are strategically planned through purposeful mapping of information scientists' skills to specific institutional priorities (Giuse et al. 2013) defined by VUMC's status as a learning health system (Friedman et al. 2015), which the Institute of Medicine (2013) described as a system with "real-time access to knowledge" that "continuously and reliably captures, curates, and delivers the best available evidence to guide, support, tailor, and improve clinical decision making and care safety and quality." Each information scientist undergoes intensive training upon joining the team and must demonstrate through formal internal and third-party verification that necessary skills have been attained before entering into complex evidence projects. To meet the needs of this dynamic environment, information scientists must possess:

- intentionally-developed and continually-refined biomedical content knowledge;
- expert literature searching, appraisal, and synthesis skills;
- understanding of research methods, study design, and reporting standards;
- deep and broad familiarity with the peer reviewed and grey biomedical literature;
- knowledge of how to evaluate bias, assess conflict of interest, and verify/corroborate claims;
- the ability to keep abreast of new evidence as it emerges and understand when it is sufficiently mature to impact practice; and
- aptitude in incorporating evidence, policy, and practice into concise categorized synthesis appropriately targeted to the user.

These skills have been deliberately honed over time through a range of effective and increasingly scalable evidence interventions. With the establishment of the Clinical Informatics Consult Service (CICS), VUMC was at the forefront of bringing information professionals directly into the critical care setting as integrated members of the rounding team, affording them the details of patient cases from which complex clinical questions arise, as well as gaining an understanding of the urgency and complexity of these questions (Jerome et al. 2001; Giuse et al. 2005; Rosenbloom et al. 2005; Mulvaney et al. 2008). The success of this program led to scaling of the effort through the Evidence-Based Medicine Literature Request Information Basket, through

which clinicians could request evidence to address a patient-specific clinical question directly via VUMC's secure electronic health record, enabling information scientists to access the patient records and reducing the need to round in person (Giuse et al. 2005; Jerome et al. 2008; PwC Health Research Institute 2012). Based on experience with rounding teams, information scientists already possessed the necessary understanding and commitment to strict adherence to confidentiality standards and Health Insurance Portability and Accountability Act compliance requirements (HIPAA 1996). In addition to responding to patient-specific requests, information scientists have been involved since 2005 with evidence provision to support the development of ordersets, which provide institution-customized protocols for in-and out-patient care plans (Giuse, Williams, and Giuse 2010).

Deidentified versions of evidence summaries produced through these programs have been consistently stored for ongoing access, both for future use and to facilitate knowledge sharing and reuse by all VUMC clinicians, beyond the initial requestor. More recently, the team developed the Clinical Systems Knowledge Acquisition and Archival Tool (CS-KAAT), which was initially created for system-agnostic documentation of legacy clinical decision support (CDS) rules alongside their supporting evidence (DesAutels et al. 2017; Fox et al. 2017) and has now been extended to other clinical knowledge artifacts (DesAutels et al. 2018). CS-KAAT facilitates the application of rich metadata to each component represented in the tool, assignment and reuse of evidence summaries and citations to all relevant artifacts, and linkage of related decision support elements and orderables extracted from different areas of the clinical enterprise. Through this work, CKM has created a central repository in which evolving institutional care policies and the evidence used to substantiate them can be committed to the institutional memory, while also providing the functionality to enable the evidence to be revisited and updated over time.

As the result of this history, CKM has formed a solid infrastructure to support the institution's complex evidence needs. Information scientists have become integrated members of established teams involved in both the production and consumption of research within and beyond the medical center, as well as often-requested partners for new initiatives that require access to reliable and current evidence in an expertly-filtered and quickly ingestible format. In the fast-paced world of healthcare in which knowledge is constantly evolving based on both population-level and individual patient-focused insights, this infrastructure bolsters the institution against the winds of change and provides a central and reliable source for producing and documenting the evidence that catalyzes the medical center's various components of research and practice.

Impacting Healthcare through Evidence and Data Management

Information scientists continue to leverage and build upon the expertise and knowledgebase generated through previous experience to engage in projects aimed at ensuring resources are properly channeled to current effective care practices and efforts to advance healthcare research by partnering with both local and cross-institutional teams. As our involvement has grown, CKM leadership has strategically focused on: 1) scalable projects in which generated evidence is used to impact decision-making at the population or institutional level; 2) complex, patient-specific questions that require precise searching and extraction of information relevant to an individual's unique clinical condition and comorbidities and therefore could not be answered by existing commercial synthesized evidence products. The information scientist's role in these efforts is not to prescribe one form of action over another but to fully represent all strains of evidence, characterizing the state of the literature including elements such as study design and sample characteristics that may affect the applicability of results, to fully and quickly inform and enable decision-making; all delivered evidence syntheses are designed to be as comprehensive as possible and include a disclaimer that they do not substitute for clinical judgment. The following examples of more recent projects illustrate the dynamic and multifaceted ways in which information scientists can organize, produce, and deliver knowledge to teams working to advance institutional goals. Below we outline the two main categories of our current projects: 1) evidence provision and data collection; 2) research collaborations.

Evidence Provision and Data Collection

Studies have shown that efforts to improve and standardize patient care, such as implementation of evidence-based ordersets and laboratory test utilization management, can reduce inappropriate ordering and save healthcare costs for institutions and patients (Mathias et al. 2016; Elnaei et al. 2015; Dayal et al. 2015; Zeidan et al. 2013; O'Connor et al. 2009). As part of the institution's mandate to align care with the best available evidence, CKM continues to provide support for developing and updating VUMC's inpatient and outpatient ordersets. As integrated members of the ordersets development team, CKM evaluates the different facets (e.g., diagnoses, lab tests, medications) of clinical ordersets and prepares review summaries for each facet, ensuring all viewpoints in the literature are represented. Sustained engagement with the ordersets development team and purposeful archiving of evidence summaries from previous updates allows CKM to leverage search strategies and other captured tacit knowledge (such as the databases and grey literature sources that are most useful to consult for a particular topic), enabling a streamlined process in which past efforts are not duplicated.

In 2017, CKM paired with diagnostic laboratory teams to provide evidence to help inform decision-making around institutional test offerings. VUMC established a Laboratory Formulary Committee in 2014 that has since been engaged in efforts to improve care value through reductions in unnecessary or inappropriate testing (Zutter, Field, and Bernard 2017; Butcher 2018). As part of this effort, information scientists assist by providing evidence syntheses regarding the clinical utility of a laboratory test in general or for a specific indication for which there is a question of appropriate use. Based on the scope of the request, information scientists develop broad or focused evidence syntheses incorporating both official recommendations, when available, as well as the supporting primary studies. Information scientists capture all identified viewpoints in the literature, and summaries developed for approved indications are further focused to highlight the evidence supporting the specific indication of interest. The overall findings for each question are summarized into “evidence briefs” that quickly distill the content in the packet for quick review by the members of the diagnostic laboratory team.

To support and manage these projects, the team leverages the functionalities of the Clinical Systems Knowledge Acquisition and Archival Tool (CS-KAAT) (DesAutels et al. 2018). Evidence syntheses for ordersets and laboratory tests are stored in CS-KAAT, which provides the ability through descriptive data to link, for example, diagnostic test records with ordersets in which those tests appear, thereby also linking the associated evidence. The tool also enables distribution of completed summaries, as appropriate, to clinical teams through tailored access. For example, laboratory evidence syntheses are made available through a custom interface to provide ongoing access to a restricted set of users from the laboratory team. The interface allows for quick review of the “evidence briefs,” as well as access to the full summary, search strategies, and related citations alongside key metadata about the laboratory test itself. To facilitate ongoing review and updates of the content, each summary in CS-KAAT is also assigned a maintenance level based on the currency and stability of the evidence on the topic, prompting automated alerts on a predefined schedule.

In addition to helping impact practice at an institutional level, CKM information scientists have also been approached to partner in the development of systematic reviews and guidelines to standardize practice on a broad scale for specific diseases or interventions (Patel et al. 2018; Deppen et al. 2016; Morandi et al. 2012). Based on our professional expertise and past experience partnering with the former Vanderbilt Evidence-based Practice Center in the development of Agency for Healthcare Research and Quality (AHRQ) comparative effectiveness reviews, the team is equipped to guide VUMC community members through the entire systematic review process, including protocol development, conducting expert literature retrieval, study selection and screening, assessing strength of evidence and risk of bias, data extraction, and finally, writing for publication. CKM devised a stepped-approach list of levels of systematic review elements which allows researchers to customize the level of assistance needed. Currently, a CKM information scientist is working with a team of clinical experts to assist in the development of a set of clinical guidelines for a pediatric condition for which no definitive guidelines are currently available.

With the business of healthcare demanding an evidence-based approach to all facets of decision-making, we now see our skills also being heavily requested by information technology teams. Electronic health records (EHRs) are becoming more and more integral as they aid in the collection and management of data needed for comprehensive healthcare. Informatics and health information technology teams are charged with optimizing both system performance and data utilization. For a recent upgrade of the medical record system at VUMC, CKM developed a model for extracting, evaluating, and organizing best practice implementation data from published and grey literature sources (e.g., user forums, conference proceedings, EHR documentation, technical white papers) which are notably difficult to find (DesAutels 2019). Given the knowledge gap in the EHR implementation literature, CKM was charged with providing and organizing an evidence-based framework to best inform informatics/HealthIT implementation decisions.

Research Collaborations

Center for Knowledge Management information scientists have developed experience with patient recruitment and study design through the conduct of original research to develop and evaluate best practices for patient communication and professional education informed by health literacy and learning styles (Giuse et al. 2012; Koonce et al. 2013; Koonce et al. 2015; Giuse et al. 2016; Kusnoor et al. 2016; Micheel et al. 2017). The team is actively sought as valued partners for collaborative research projects, while continuing to lead independent research initiatives originated by CKM. These efforts span the full range of precision/personalized medicine, including investigation of drugs targeted to specific genetic mutations; evaluation of questionnaires to standardize collection of data across clinical settings on the social and behavioral factors that affect health; and substantiating content for a research project aimed at educating clinical trial recruiters on best practices for enrollment of underrepresented populations (Frakes 2019). Information scientists' intimate knowledge of the biomedical literature and ability to organize information extracted from various sources into packaged, consumable, and sharable knowledge products are also recognized by our research partners as key catalysts for discovery.

Accelerating Drug Development and Repurposing Incubator

Given the increasing time and cost of new drug development, a multidisciplinary team of experts known as the VUMC Accelerating Drug Development and Repurposing Incubator (ADDRI) is working to identify and evaluate existing drugs with potential for repurposing. They seek new drug indications that target proteins of interest using gene-disease associations from genome-wide association studies (PheWAS) (Naylor et al. 2018; Pulley et al. 2017). Composed of researchers from the basic and clinical sciences, legal experts, and other stakeholders, the team requires an information scientist with expertise in biochemistry and knowledge of relationships between genes, proteins, pathways, and disease. In response to requests for evidence reviews to validate identified relationships between genetic mutation and phenotype, the CKM information scientist locates and compiles data from multiple databases and resources, in addition to peer reviewed and preprint literature. This work requires an understanding of protein expression, structure, and function to correctly interpret collective evidence and prediction algorithms to answer the original question and support decision-making with regard to advancing the drug for further investigation. ADDRI's approach reduces the projected average time required to initiate and validate a drug discovery project from years to months and has already resulted in several projects reaching Phase II clinical trials, targeted to conditions across the clinical spectrum (Naylor et al. 2018).

Social and Behavioral Determinants Research

The CKM team has also partnered in a series of studies to understand social, behavioral, and economic factors that impact individuals' health, which are collectively referred to as social determinants of health. The first study evaluated a set of measures recommended by the Institute of Medicine (now called the National Academy of Medicine) Committee on Recommended Social and Behavioral Measures for Electronic Health Records (Giuse et al. 2017). For this project, information scientists collaborated with the two Committee co-chairs, which included VUMC's Chief Strategy Officer, as well as colleagues from the University of California, San Francisco. Because the questions identified by the Committee were obtained from multiple instruments, the team initially worked to harmonize them into a single questionnaire. Using an online patient sample, the study evaluated the feasibility of administering the combined question panel, assessed the effect of question order, determined completion time rates, and investigated unanswered question response patterns. The second study replicated the feasibility findings and additionally found an association between the measures with self-reported health (Prather et al. 2017).

After completing these projects, CKM initiated further research on assessment of social determinants of health specifically in the community clinic setting, where social and behavioral determinants are highly likely to play a role in health (Koonce et al. 2017; Kusnoor et al. 2018). This study used questions from the Protocol for Responding to and Assessing Patients' Assets, Risks, and Experiences (PRAPARE), an instrument that had been developed specifically for the community clinic population (National Association of Community Health Centers 2016). In addition, the team included questions from the National Academy Medicine questionnaire (Adler and Stead 2015) that had not been addressed by PRAPARE and also added two questions from the Federal Reserve Board's Survey of Household Economics and Decisionmaking to better understand financial strain (Board of Governors of the Federal Reserve Board 2017). The study results demonstrated the feasibility of using this combined, more holistic questionnaire to evaluate social determinants of health in the community clinic setting.

As a next step of this research, CKM began to explore how to connect patients to local services after identifying social needs with the evaluated instruments. Using skills in metadata and knowledge management, information scientists created a database of community resources in the Nashville area to help address needs identified through the social determinants of health questionnaire administered to community clinic patients. The database is freely available to others through our Center for Knowledge Management website.

All of Us Research Program

All of Us (AoU) is a federally-funded research study seeking to enroll a diverse sample of 1 million participants across the United States to investigate how individual genetic, lifestyle, behavioral, and environmental factors impact health (Collins and Varmus 2015). As part of the preparatory/pilot phase of this initiative, CKM information scientists contributed to the development of participant survey instruments by locating and extracting information from published validation studies for survey questions of interest, including details on the study design and characteristics of the validation population. Leveraging expertise in literacy, social determinants of health, study design/appraisal, and information retrieval, information scientists have also provided advice on versioning tools, conducted pilot interviews of potential participants, and provided quality control of survey question provenance. CKM continues to be actively involved in this important national collaborative project. Recent contributions include the collection and compilation of validation studies of social determinants of health measures for use in the continuing development of AoU online patient surveys; collaboration on the design and structure of an AoU survey question portal designed for researcher access; and conducting a competitive landscape analysis of large-scale high quality longitudinal cohort studies in support of the design of a "Research Hub" for access to AoU data by researchers and citizen scientists.

Evaluation

Given the breadth and depth of the range of programs in which CKM is integrated, ongoing evaluation of these efforts is critical for process refinement and communication of the team's effectiveness and impact to medical center leadership. As part of VUMC's annual evaluation process, CKM solicits feedback from collaborators using a survey that asks respondents to rate outcomes resulting from the provided information, such as "knowledge gained" and "improved patient care," on a Likert scale from 1 (low) to 7 (high). Information scientists' evidence products are also evaluated by their peers, using similar items, to assess their efficacy from the perspective of other highly-trained information professionals. Past evaluations have yielded positive results, with all CKM team member evaluations receiving high scores from external collaborators. Collecting this data has allowed CKM to track outcomes over time to ensure consistency of quality as personnel and projects change. Qualitative user feedback is also tracked throughout the year and compiled and reported to leadership to supplement the findings from the formal survey. Internally, all individuals on the team are annually evaluated by their peers through a 360 performance review process, as many of the projects include both internal and external collaborators. As a result, CKM staff become very aware of their peers' skillsets and in turn remain invested in contributing their highest quality product to VUMC. Thus, the 360 review provides the team with a highly personalized understanding of both the caliber of their skills and opportunities for quality improvement. Additionally, formal evaluations of the Clinical Informatics Consult Service (Mulvaney et al. 2008), as well as subsequent systematic reviews of evidence services delivered by biomedical information scientists in general, have found that these services can inform clinicians' decision-making, save time, and impact patient care (Perrier et al. 2014; Brettle et al. 2010).

Conclusions

Vanderbilt University Medical Center's healthcare advancements in education, patient care, and research created the perfect opportunity for CKM to develop into the type of special information scientist group capable of fully participating as partners in the multitude of projects and collaborations described in this paper. Through years of development and refinement of a robust infrastructure support framework, CKM's information professionals have been able to combine their expertise in information science with rapidly-acquired, in-depth content knowledge and contribute a uniqueness of skills while understanding the roles and processes of all partners. By focusing the team effort on scalable projects and establishing mechanisms for documenting, accessing, and building upon existing knowledge, CKM ensures the impact of our work is not only on the individual team or clinician who receives an evidence summary or research product, but also on the organization as a whole. The knowledge gained feeds into VUMC's learning health system and aids in guiding both the practice and advancement of healthcare.

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Leadership in Turbulent Times

Organizations experiencing dramatic change pose special challenges for leaders and can provide case studies on how to foster unity and engagement while considering disparate views.

BY DEBBIE SCHACHTER, MLS, MBA, EDD

I'm pleased to have the opportunity to write this inaugural "On Leadership" column, in which members of the SLA Leadership and Management Division will highlight leadership traits and share success stories.

It is interesting to reflect on the range of leadership styles and the leaders we admire. Sometimes a leader is highly effective but may not mesh with your style; in other cases, a leader may be very effective at some aspects of their role, such as interpersonal skills, but unable to move an organization forward as necessary. Context and situation are significant factors in how leaders can achieve results and influence others.

For example, the role of SLA president is particularly critical given the amount of change that has occurred in the association. As I consider my time serving in leadership roles in SLA, and particularly during the years that I was on the SLA Board of Directors, I am reminded of the leadership style of 2015 President Jill Strand.

Before working closely with Jill, I knew her to be a competent, engaged SLA member who was able to build enthusiasm among those around her. During her term as president-elect,

president, and immediate past president, I was able to observe Jill's style of engaging others to sustain SLA and position it as *the* critical association for information professionals.

Jill's leadership was critical because, like many other professional associations, SLA has had to transition to ensure its continuing relevance and

While not everyone will necessarily be satisfied with a chosen solution, effective leaders show that they are listening and hear what is being said, and they acknowledge disparate opinions and concerns.

success in our new economic and societal paradigm. In recent years, SLA leaders have had to make difficult decisions and possess the courage and strength to bring about significant change across the association.

In her role as president, one of Jill's most obvious strengths was her ability to ask difficult questions and encourage

a robust conversation among stakeholders to address problems and concerns. For an association president, leadership challenges are particularly notable in that there is a limited time in which to identify and act on critical concerns, while also ensuring that stakeholders support and contribute to the leadership's mandate.

During the period that we worked together, one aspect of Jill's style that demonstrated effective leadership to me was the way she brought together disparate views and considered many members' opinions to develop better solutions. Her practice was to create structured processes for leading discussions and surfacing disagreements

among leaders and volunteers. These mechanisms supported effective consideration and resolution of problems.

While not everyone will necessarily be satisfied with a chosen solution, effective leaders show that they are listening and hear what is being said, and they acknowledge disparate opinions and concerns. Using clear and transparent

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processes for decision making is one of the best ways to lead others.

Change in any organization is difficult, particularly in an association where many different perspectives are reflected and where there is deep and personal engagement. Change management employs some of the principles I noted above, and it is one way that Jill and other recent SLA presidents have supported SLA's transition into an association for the 21st century. To face the challenges of developing a shared vision for a new future, skills related to communication, engagement, and transparency support effective change management. In particular, the ability to convey a positive vision of the organization's future, whether that future is in one year or ten years, is a requirement of leading in times of turbulence.

From my perspective as an SLA volunteer leader, Jill's clear charge for action and her investment in taking the time to make the best decisions while maintaining a positive perspective on the future state were strong motivators. Jill's communicative style showed that she was a reflective leader, always asking herself how best to lead the association.

As I described earlier, the many varieties of leadership situations require distinctive leadership styles, and not all leaders can be effective in all contexts. In my experience within SLA, we have been fortunate to elect leaders who have been able to pick up the change mandate from previous administrations and continue the forward momentum that has been needed. Jill's style is one example of the way that leaders step up to their leadership challenges, and I continue to reflect on the impact that Jill's positive leadership style has had on me in my volunteer and professional work. **SLA**

Info Insights

Continued from page 2

U.S. legislation designed to protect private health information from fraud and theft.

"We do sometimes, in our work, come into contact with patient information," Mallory says. "For instance, when we're answering a question for a clinician, we sometimes get specific information about the patient case through the electronic health record. But we're always careful to keep it to ourselves only, using it only to the extent that we need to find the most targeted information that can help that provider and address that specific patient's situation."

While the focus of this issue of *Information Outlook* is information privacy, it also offers perspectives on two other topics of interest to librarians and info pros: leadership and competitive intelligence. Two new columns sponsored by SLA communities, the Leadership Division and the Competitive Intelligence Division, make their debut in this issue. Be sure to read Debbie Schachter's take on leadership styles and Jennifer Swanson's review of an article comparing legal data analytics programs. **SLA**

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Data Analytics Programs: A Comparative Study

A comparison of several legal data analytics packages revealed no clear leader in the field and the need for librarians to continue to conduct manual research.

BY JENNIFER SWANSON, MLS, MBA

With multiple data analytics packages available to law firms and law libraries, how do legal librarians determine how they stack up?

A group of four law librarians conducted a study to evaluate seven data analytics programs, all of which focus on federal law: Bloomberg Law, Docket Alarm Analytics Workbench, Docket Navigator, Lex Machina, Lexis Context, Monitor Suite, and Westlaw Edge. The results of their study were reported in a July 15 article in law.com titled “Law Librarians Push for Analytics Tools Improvement after Comparative Study.”

To perform a fair evaluation, the authors asked 27 law librarians from both academia and law firms to evaluate two platforms apiece over the course of one month. As part of the evaluation, the 27 law librarians posed 16 realistic questions (which were created by law librarians and attorneys) to the analytics programs. One such question is the following: “In how many cases has Irell & Manella LLP appeared in front of Judge Richard Andrews in the District of Delaware?” The correct answer is 13, but none of the seven platforms answered correctly.

This particular question highlighted a major issue—namely, that there is

little consistency between platforms. As the article states, “Bloomberg had issues with the IP aspects of the search, Docket Navigator and Lex Machina had false hits for attorneys who had left, Monitor Suite focused more on opinions rather than dockets, and Westlaw Edge automatically filtered for the top 100 results, of which Irell & Manella was not one.” The authors concluded that manual research is still necessary until these systems are more trustworthy.

A second issue was that, when evaluating these systems, the reviewers did not feel they were comparing “apples to apples.” Each system has its own strengths and weaknesses, so there wasn’t a way to declare a clear winner. For example, Jeremy Sullivan, manager of competitive intelligence and analytics at DLA Piper, stated that Context is his choice for expert witnesses but that he uses Monitor Suite for competitive intelligence because it offers “granular tagging and exhaustive filters and lists.”

Notwithstanding these challenges, the testers were able to develop some recommendations based on functionality and learning curve:

Ease of use (least difficult to most difficult):

Bloomberg >> Context >> Monitor

Suite >> Docket Navigator >> Edge >> Lex Machina >> Docket Alarm

Functionality (fewest features and complexity to most features and complexity):

Bloomberg >> Context >> Lex Machina >> Docket Navigator >> Edge >> Monitor Suite >> Docket Alarm

The testers also gained some insights into the analytical platforms. There is a need for flexibility in these systems; more importantly, transparency is crucial to understanding and explaining each platform’s strengths and limitations to attorneys. Providing the wrong information can ruin the trust of both the librarian and the attorney. “It’s tough to get the trust of the attorney back,” says Tanya Livshits, director of research services at Irell & Manella.

The best choice of platform ultimately depends on different factors, such as use case. Law librarians need to conduct their own tests and consider some of the following factors:

- Think about your use case (e.g., practice area and key users) prior to deciding what and how to test.
- Record the dates and times of searches, which are key for comparing results.
- Use real-world examples.
- Detail your search strategy (date ranges, steps taken, and outside resources used).

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- Remember to capture images and export data.

There are several issues around training as well. There should be training for the trainers as well as more tools to improve learning, such as short videos on Vimeo or YouTube and PDF training documents.

When using the systems to perform searches, recommended improvements include pre-set searches with buttons or checkboxes to combine features and the ability to mouse over specific words to reveal search strategy reminders.

Finally, analytics platforms can do a better job of combining and offering features. “Many of [these platforms] are content to say you can’t be all things to all people,” Sullivan said. “Well, I would say you’re not trying.” **SLA**

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Lavallée-Welch to Lead SLA in 2021

In online balloting conducted in September, SLA members elected **Catherine Lavallée-Welch**, university librarian at Bishop's University in Sherbrooke, Quebec, Canada, to serve as president of the association in 2021.



Catherine Lavallée-Welch

Catherine joined SLA in 2000 while at the University of Louisville and has since worked in libraries in Canada, Europe, and the United States. She has chaired SLA's Academic Division and Information Technology Division, served on the board of the Science-Technology Division, and served on the SLA Board of Directors (2015-2017). She writes and presents frequently on issues ranging from blogging to technology to distance learning.

Catherine was named a Fellow of SLA in 2014 at the association's annual conference in Vancouver, British Columbia. Fellowship in SLA is bestowed on active, mid-career SLA members in recognition

of past, present and future service to the association and the profession.

Catherine will serve as president-elect of SLA in 2020, president in 2021, and past president in 2022. Joining her on the board in January 2020 are the following SLA members, who were also elected to serve three-year terms:

Natasha Chowdory, clinical evidence-based information specialist at University Hospitals Coventry and Warwickshire (Coventry, England, United Kingdom)
2020-2022 Director

Elaine Lasda, subject librarian for social welfare and research impact at the University at Albany (New York)
2020 Chapter Cabinet Chair-elect/2021 Chair/2022 Past Chair

Jim Miller, principal at Connect Public Affairs (Ottawa, Ontario, Canada)
2020-2022 Director

Julie Snyder, corporate librarian and archivist at Shure Incorporated (Niles, Illinois)
2020 Division Cabinet Chair-elect/2021 Chair/2022 Past Chair

The election was held online during September 4-18. Prior to the election, the candidates participated in a Twitter chat and in online discussions with SLA members.

The newly elected board members will join the following current members of the board whose service extends through 2020:

- **Tara Murray**, 2020 President
- **Hal Kirkwood**, 2020 Past President
- **Bill Noorlander**, 2019-2021 Treasurer
- **Robin Dodge**, 2020 Chapter Cabinet Chair
- **Valerie Perry**, 2020 Past Chapter Cabinet Chair

- **Jill Konieczko**, 2020 Division Cabinet Chair
- **Hildy Dworkin**, 2018-2020 Director
- **Amy Jankowski**, 2018-2020 Director

The 2020 Board of Directors will hold its first meeting at the 2020 SLA Leadership Symposium in McLean, Virginia, on January 18-20.

Members Invited to Review Conference Proposals

To further ensure that the most relevant and engaging sessions possible will be presented at the SLA 2020 Annual Conference in Charlotte, association members were invited to participate in an open review of the session proposals and provide a rating and comments.

The proposals were grouped by topic and made available for member review on SLA Connect, SLA's community platform. The reviews were "blind" (i.e., the proposals did not include the names of the submitters, allowing members to evaluate each proposal on the basis of its merits).

Approximately 70 SLA members participated in the review process, which lasted two weeks. The member feedback will be included in the final review process, which will be conducted by the SLA Annual Conference Advisory Council. **SLA**