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INTRODUCTION

The ARMA International Educational Foundation (Foundation) is publishing Volume 1 of its Peer Reviewed Journal (PRJ), devoted to quality, independent research on topics related to information and records management. The Foundation is a leading organization that embraces the practical and scholarly knowledge of information management by funding and promoting research, scholarship, and educational opportunities for information management professionals.

In this issue of the Journal, the Foundation received interesting cited research articles related to the theme of information management and records in the age of crisis management, business continuity, and economic support via records of the public. This is particularly timely as the world is struggling with the pandemic in addition to climate and economic crises. The articles in this volume reflect that theme.

ARTICLE ABSTRACTS AND AUTHOR BIOGRAPHIES

Potential Risks that U.S. Businesses Face with the Collection and Retention of Employee Medical Data throughout the COVID-19 Pandemic

Pandemics test business infrastructures and capabilities to adapt. Businesses must ensure that employees are able to conduct work in a safe environment and also address health concerns. One of the biggest conundrums centers on how to notify employees of potential exposure discretely, sharing health conditions of employees, and stay within the boundaries of privacy laws and regulations. During a pandemic, it is crucial to comply with the Health Insurance Portability and Accountability Act of 1996 ("HIPAA") as well as state and local laws, regulations, and ordinances. This article explores potential blunders and benefits that U.S. businesses have faced when considering to retain biometric data. The article will explore this in relationship to the coronavirus disease 2019 ("COVID-19").

There are key questions that all businesses may consider throughout a pandemic. First, are health screenings required for employees? Second, how should health screening be administered and recorded? Third, may a business require their employees to be vaccinated? This article presents considerations that a business should keep in mind, as well as the potential risks they should watch out for when operating during a pandemic.

Megan Butcher, CRM, CIPP/US, ITIL Bio:

As a Certified Records Manager (CRM) and Certified Information Privacy Professional - US (CIPP/US), Megan Butcher, CRM, CIPP/US, ITIL has experience with implementing policies and procedures for managing information throughout its lifecycle and experience developing privacy programs to protect Personally Identifiable Information (PII). Megan currently serves as a Director on the ARMA International Board of Directors for the 2021-2022 term. Megan is the Past-President of the Orange County, CA chapter of ARMA (OCARMA), which won the 2020 ARMA Chapter Luminary Award. Megan also serves as one of four Chairpersons for the International Association of Privacy Professionals of Orange County, CA (IAPP-OC for IAPP KnowledgeNets). Megan enjoys speaking and writing to help people understand information management in simpler terms. Megan has presented for several ARMA chapters, at ARMA InfoCon 2020, during the ARMA Pacific Region Conference, and co-presented CRM training in 2020 and 2021. Megan and Grant Voss previously collaborated, along with Brandy Worden and Kris Coats, to write the scholarly article "Women in STEM and the Laws that

Enabled Diverse Innovation" was published in the Chapman Law Review journal (May 2020).

Grant J. Voss, Esq., CIPP/US:

Grant J. Voss, an Associate Attorney at the Buchalter Law Firm, is an accomplished individual with a variety of strengths stemming from combined business acumen and legal knowledge. Grant is a Certified Information Privacy Professional - US (CIPP/US) and has experience assisting organizations with their privacy practices and policies.

"Never Waste a Crisis": A Holistic Approach to Privacy, Transparency and Secrecy for Records Resilience

For recordkeeping to continue to meet the needs of people in the face of continuing change and potential crises, we need flexible, human-centered approaches to emerging questions of access and privacy. This paper presents a framework for considering privacy, secrecy, and transparency as choices that can either enable or constrain a number of values and actions, depending upon context. This paper also traces the central role of records and recordkeeping in supporting our ability to make such choices.

Darra Hofman, PhD, JD, MSLS

Dr. Darra Hofman is an Assistant Professor and the Program Coordinator for the Master of Archives and Records Administration at the School of Information at San José State University. Her work examines the intersection of recordkeeping, technology, and human rights to ask how records can support human flourishing.

The Importance of AI and Semantic Approaches to Information Retrieval for COVID-19 Literature

The mass circulation of inaccurate or false information during the COVID-19 pandemic continues to pose major challenges for crisis management. The World Health Organization (WHO) had coined the term "Infodemic" in 2020 to describe this recent phenomenon. The infodemic crisis concerns the needs of researchers, health workers, and policy makers who seek to retrieve scientifically accurate and verifiable information from the COVID-19 literature for improved, evidence-based decisions regarding the pandemic. This research article will conduct a review of the available literature to assess the relationship between the applications of AI and infodemic management, with a focus on the information retrieval process and recent initiatives involving partnerships between international, national and local organizations and the AI community. This article will explore how recent developments in AI and its

applications may benefit the information retrieval process through semantic approaches. The applications of AI which will be reviewed are Machine Learning (ML), Natural Language Processing (NLP), and Deep Learning (DL), in addition to semantic search engines such as ACM, BERT and Co-Search that are designed to more precisely match text and datasets to search queries.

Biography:

Petar Veljko grew up in Toronto, Canada where he currently resides. He had graduated from the University of Toronto with an ALA-accredited Master of Information Degree in 2018. He has an interest in AI and Big Data and how these technologies affect the fields of library and information science and knowledge and information management. He is currently working at Legal Aid Ontario and Smart Info Management Services, a consultancy for information management.

Potential Risks that U.S. Businesses Face with the Collection and Retention of Employee Medical Data throughout the COVID-19 Pandemic

Megan Butcher, CRM, CIPP/US, ITIL and Grant Voss, Esq., CIPP/US

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The COVID-19 pandemic continues to test business infrastructures and their capabilities to adapt operations in a manner that keeps employees safe while remaining open for business. In order to avoid potential risks, businesses must address health concerns for employees who are not working from home, as well as take steps to ensure that the physical workplace is a safe environment.

One problem that has many businesses confused, is determining what steps are permitted or required to ensure the workplace is safe and complies with federal, state, and local guidelines, while simultaneously staying within the boundaries of privacy laws and other applicable regulations. This article explores the potential risks that U.S. businesses face when considering the collection and retention of medical data from their employees during the COVID-19 pandemic, and possible future pandemics. This is done by addressing three questions: 1) Are health screenings required for employees? 2) How should health screenings be administered and recorded? and 3) Can businesses ask or require their employees to be vaccinated?

I. Are Health Screenings Required for Employees?

After COVID-19 was officially deemed to be a pandemic on March 11, 2020,¹ the Center for

¹ “11 March 2020 Deeply concerned both by the alarming levels of spread and severity, and by the alarming levels of inaction, WHO made the assessment that COVID-19 can be characterized as a pandemic.” “Archived: WHO Timeline -

COVID-19.” World Health Organization. World Health Organization. Accessed January 25, 2021.
<https://www.who.int/news-room/detail/27-04-2020-who-timeline---covid-19>.

Disease Control ("CDC") provided guidance for business behaviors and best practices,² and the Equal Employment Opportunity Commission ("EEOC") announced that health monitoring by employers would be an option for trying to keep the workplace safe. The EEOC³ and CDC⁴ do not officially require health monitoring and screening since employee interactions vary by business, but they do provide recommendations and resources for businesses to rigorously evaluate their practices and implement a plan to address COVID-19 that best fits their own needs.

The riskiest mistake that a business can make is to not know

if it is required to administer health screenings in the first place. There are different types of health screenings; the most common type consists of a temperature check⁵ and asking employees a standard set of screening questions.⁶ For information regarding what employee medical data may be collected, its use, how and where it should be securely stored, the length of time for retention, and potential legal ramifications, businesses should consult the laws, regulations, and retention standards within their state, county, and local jurisdictions and specific industry. More information regarding this matter is shared in the next section of this article,

² "General Business Frequently Asked Questions." Centers for Disease Control and Prevention. Centers for Disease Control and Prevention. Accessed January 25, 2021. <https://www.cdc.gov/coronavirus/2019-ncov/community/general-business-faq.html>.

³ What You Should Know About COVID-19 and the ADA, the Rehabilitation Act, and Other EEO Laws, U.S. Equal Employment Opportunity Commission (June 17, 2020), "What You Should Know About COVID-19 and the ADA, the Rehabilitation Act, and Other EEO Laws." U.S. Equal Employment Opportunity Commission. Accessed January 25, 2021. <https://www.eeoc.gov/wysk/what-you-should-know-about-covid-19-and-ada-rehabilitation-act-and-other-eeo-laws>.

⁴ "General Business Frequently Asked Questions." Centers for Disease Control and Prevention. Centers for Disease Control and Prevention. Accessed January 25, 2021.

<https://www.cdc.gov/coronavirus/2019-ncov/community/general-business-faq.html>.

⁵ Should we be screening employees for COVID-19 symptoms (such as temperature checks)? What is the best way to do that? "General Business Frequently Asked Questions." Centers for Disease Control and Prevention. Centers for Disease Control and Prevention. Accessed January 25, 2021. <https://www.cdc.gov/coronavirus/2019-ncov/community/general-business-faq.html>.

⁶ Should we be screening employees for COVID-19 symptoms (such as temperature checks)? What is the best way to do that? "General Business Frequently Asked Questions." Centers for Disease Control and Prevention. Centers for Disease Control and Prevention. Accessed January 25, 2021. <https://www.cdc.gov/coronavirus/2019-ncov/community/general-business-faq.html>.

"How Should Health Screenings Be Administered and Recorded?"

Whether or not health screenings are required in a particular industry is dependent upon the individual state, county, and local health officials. At the time of drafting this article (March 2021), certain states require employers to follow certain sets of protocols. For example, New Mexico generally requires employers to screen employees by asking questions prior to their arrival at the workplace on a daily basis, with more specific requirements depending on the industry.⁷ The State of Colorado requires an option for large employers that have over 50 employees in one or more locations, to set up symptom screening and temperature checks, or require that an employee self-screen prior to arrival at the work,

⁷ "All Together New Mexico, COVID-Safe Practices for Individuals and Employers." New Mexico Department of Health. April 26, 2021.

<https://indd.adobe.com/view/3f732e94-0164-424d-9ac6-a0ace27e70c8>. Pg 10

"Tenth Amended Public Health Order 20-36,

⁸ "Tenth Amended Public Health Order 20-36,

https://drive.google.com/file/d/1euTwg2K_zkBTYBYpCWmZsMId45ckacau8/view.

April 4, 2021. pg 21

⁹ "COVID-19 Employer Playbook," California Department of Public Health, September 25, 2020.

<https://files.covid19.ca.gov/pdf/employer-playbook-for-safe-reopening--en.pdf> pg 7;

"COVID-19 Employer Playbook" STANDARDS PRESENTATION TO CALIFORNIA OCCUPATIONAL SAFETY AND

and to then report the results to the employer.⁸

In some instances, a county may have different, stricter health screening requirements than its state. The State of California only requires a business to have in place a process to screen and respond to employees with COVID-19 symptoms,⁹ while the County of San Francisco has a requirement that all working employees must be screened and answer specific questions daily,¹⁰ creating a stricter, and more specific, screening requirement than the State.

As mentioned, the state and local laws for a business' location determine whether health screenings are truly required for employees. A business would be prudent to consult legal counsel,

HEALTH STANDARDS BOARD." TITLE 8, DIVISION 1, CHAPTER 4. CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD. Accessed January 25, 2021.

<https://www.dir.ca.gov/oshb/documents/COVID-19-Prevention-Emergency-apprvdtxt.pdf>. pg 3 found through "This Won't Hurt a Bit: Employee Temperature and Health Screenings – A List of Statewide Orders." Littler Mendelson P.C., January 25, 2021.

<https://www.littler.com/publication-press/publication/wont-hurt-bit-employee-temperature-and-health-screenings-list>.

¹⁰ "Attachment A-1: Personnel Screening Form." SFCDCP, January 20, 2021.

<https://www.sfdph.org/dph/alerts/files/C19-07-Personnel-Screening-Attachment-A-1.pdf>.

and to frequently check state and local guidelines to consistently monitor any changes or updated guidelines to avoid any potential risk by not screening their employees when it is required. Even if there is no requirement for screenings, the CDC advises that “screening employees is an optional strategy that employers may use.”¹¹

II. How Should Health Screenings Be Administered and Recorded?

A. Types of Screenings

The CDC has provided recommendations for onsite and offsite screening methods a business may follow if a specific method of administering and recording health screenings is not required by state or local health officials in the jurisdiction in which the business is located.

Businesses that choose to administer onsite health screenings should implement methods that protect both the screener and

subsequent employees who are screened. Methods recommended by the CDC include social distancing and the proper use and disposal of personal protective equipment (PPE), as well as the use of physical barriers between the screener and employee.¹² However, onsite screenings have a possible downside: if the employee is experiencing symptoms, the possibility of COVID-19 will not be discovered until the individual has been to the work location, and therefore, may expose the screener or others to COVID-19.

Another method recommended by the CDC is “virtual health checks.” An employee can conduct a “virtual health check” at home, before leaving their residence for work, by checking for COVID-19 symptoms, answering screening questions, or using a thermometer to check their own temperature.¹³ This method reduces the risk of employees arriving at the workplace with symptoms. It also shields employees from sharing their health condition with other persons

¹¹ “General Business Frequently Asked Questions.” Centers for Disease Control and Prevention. Centers for Disease Control and Prevention. Accessed January 25, 2021.

<https://www.cdc.gov/coronavirus/2019-ncov/community/general-business-faq.html>.

¹² “General Business Frequently Asked Questions.” Centers for Disease Control and Prevention. Centers for Disease Control and Prevention. Accessed January 25, 2021.

<https://www.cdc.gov/coronavirus/2019-ncov/community/general-business-faq.html#Reducing-the-Spread-of-COVID-19-in-Workplaces>.

¹³ “General Business Frequently Asked Questions.” Centers for Disease Control and Prevention. Centers for Disease Control and Prevention. Accessed January 25, 2021.

<https://www.cdc.gov/coronavirus/2019-ncov/community/general-business-faq.html>.

that who do not have a need-to-know the employee's health status. However, if a business wants to ensure that everyone is screened in a uniform and precise manner, in-person screenings may be the preferred option because the business will then have more control over the screening process and methodology.

If a workplace decides to conduct in-person screening, anonymization of the screening results will ensure medical data is kept private, and thereby avoid the complexities associated with retaining the medical data of in-person screenings. If a workplace decides to retain medical data from in-person screenings, developing a defensible records retention and disposition schedule for such information is highly recommended. Information should be kept secure when in use, and stored or destroyed appropriately when no longer necessary. Further, workplaces, especially those not within the health industry, may want to consider the risks of

collection and retention of employee medical data due to the possibility of legal challenges.

B. Medical Data Retention Considerations

At first blush, it is easy to have the mistaken belief that the only laws that impact the retention of the medical data derived through a screening process are those laws set forth by state and local health officials. However, there are other laws that come into play that may not have previously been considered. Some of these additional laws may apply depending on the specific jurisdiction in which the business is located.

Legislation, such as the Americans with Disabilities Act ("ADA"), continue to apply during the COVID-19 pandemic,¹⁴ and during "normal times," asking an employee to submit to a temperature check would be considered a "medical examination" and potentially violate the ADA,¹⁵ which does not

¹⁴ "What You Should Know About COVID-19 and the ADA, the Rehabilitation Act, and Other EEO Laws." U.S. Equal Employment Opportunity Commission. Accessed January 25, 2021. https://www.eeoc.gov/wysk/what-you-should-know-about-covid-19-and-ada-rehabilitation-act-and-other-eeo-laws?mkt_tok=eyJpIjoiWW1FMk5qaGpOMIZrTUDJNSIsInQiOjJhWXI4OXBHVlJDSGRcL1dMaVVUNzk2Rkl6ZFkDRnBkbkp3TG51M3R3OHIOWVJmcVdQmtHN1ZoanFyNWs1Tk0xdHZ4QVFSDIwaDMzVIRBemJmaExGd3gxc2c3Zk1tYzQ5UExXNHZZUENVU3NCbG5yN3lsRWNvd240RFJqQVNqMFcifQ%3D%3D.

¹⁵ "What You Should Know About COVID-19 and the ADA, the Rehabilitation Act, and Other EEO Laws." U.S. Equal Employment Opportunity Commission. Accessed January 25, 2021. https://www.eeoc.gov/wysk/what-you-should-know-about-covid-19-and-ada-rehabilitation-act-and-other-eeo-laws?mkt_tok=eyJpIjoiWW1FMk5qaGpOMIZrTUDJNSIsInQiOjJhWXI4OXBHVlJDSGRcL

permit medical examinations that are not a job-related business necessity.¹⁶ In light of this, the EEOC has given permission for businesses to request and conduct health screenings for COVID-19 symptoms, as necessary, to protect the workplace.¹⁷ Furthermore, under the ADA, if a business discovers that an employee has tested positive for COVID-19, the employer must take steps to protect the identity of the individual, and keep the fact that an employee has (or may have) COVID-19 confidential.¹⁸ If screening does disclose that an

employee has COVID-19 symptoms, and the employee subsequently tests positive for COVID-19, a possible response to proactively protect the workplace involves confidentially interviewing the individual to discover who else may have been exposed, and then immediately inform those individuals while keeping the identities of all employees confidential.¹⁹

The Occupational Safety and Health Administration ("OSHA")

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¹⁶ U.S.C. Sec 12112(d)(4) found at Americans with Disabilities Act of 1990, AS AMENDED with ADA Amendments Act of 2008. Accessed January 25, 2021. <https://www.ada.gov/pubs/adastatute08.htm#12112d>.

¹⁷ "What You Should Know About COVID-19 and the ADA, the Rehabilitation Act, and Other EEO Laws." U.S. Equal Employment Opportunity Commission. Accessed January 25, 2021. https://www.eeoc.gov/wysk/what-you-should-know-about-covid-19-and-ada-rehabilitation-act-and-other-eeo-laws?mkt_tok=eyJpIjoiWW1FMk5qaGpOMIZrTUDJNSIsInQiOjJhWXI4OXBHVlJDSGRcL1dMaVVUNzk2Rkl6ZFdKRnBKbkp3TG51M3R3OHIOWVJmcVdBQmtHN1ZoanFyNWs1Tk0xdHZ4QVFSZDIwaDMzVIRBemJmaExGd3gxc2c3Zk1tYzQ5UExXNHZZUENVU3NCbG5yN3lsRWNvd240RFJqQVNqMFcifQ%3D%3D

¹⁸ "What You Should Know About COVID-19 and the ADA, the Rehabilitation Act,

and Other EEO Laws." U.S. Equal Employment Opportunity Commission. Accessed January 25, 2021.

[https://www.eeoc.gov/wysk/what-you-should-know-about-covid-19-and-ada-rehabilitation-act-and-other-eeo-laws?mkt_tok=eyJpIjoiWW1FMk5qaGpOMIZrTUDJNSIsInQiOjJhWXI4OXBHVlJDSGRcL1dMaVVUNzk2Rkl6ZFdKRnBKbkp3TG51M3R3OHIOWVJmcVdBQmtHN1ZoanFyNWs1T
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3D](https://www.eeoc.gov/wysk/what-you-should-know-about-covid-19-and-ada-rehabilitation-act-and-other-eeo-laws?mkt_tok=eyJpIjoiWW1FMk5qaGpOMIZrTUDJNSIsInQiOjJhWXI4OXBHVlJDSGRcL1dMaVVUNzk2Rkl6ZFdKRnBKbkp3TG51M3R3OHIOWVJmcVdBQmtHN1ZoanFyNWs1T
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3D)

¹⁹ "What You Should Know About COVID-19 and the ADA, the Rehabilitation Act, and Other EEO Laws." U.S. Equal Employment Opportunity Commission. Accessed January 25, 2021.

[https://www.eeoc.gov/wysk/what-you-should-know-about-covid-19-and-ada-rehabilitation-act-and-other-eeo-laws?mkt_tok=eyJpIjoiWW1FMk5qaGpOMIZrTUDJNSIsInQiOjJhWXI4OXBHVlJDSGRcL1dMaVVUNzk2Rkl6ZFdKRnBKbkp3TG51M3R3OHIOWVJmcVdBQmtHN1ZoanFyNWs1T
k0xdHZ4QVFSZDIwaDMzVIRBemJmaExGd
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3D](https://www.eeoc.gov/wysk/what-you-should-know-about-covid-19-and-ada-rehabilitation-act-and-other-eeo-laws?mkt_tok=eyJpIjoiWW1FMk5qaGpOMIZrTUDJNSIsInQiOjJhWXI4OXBHVlJDSGRcL1dMaVVUNzk2Rkl6ZFdKRnBKbkp3TG51M3R3OHIOWVJmcVdBQmtHN1ZoanFyNWs1T
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3D)

also requires that employers²⁰ maintain records of COVID-19 illnesses that are confirmed, or those that are possibly the result of a “work-related”²¹ event.²² If an employee has a severe reaction to COVID-19, the employer must report to OSHA within eight hours of any fatality resulting from exposure at the workplace,²³ or report to OSHA within 24 hours after learning that their employee is hospitalized with COVID-19.²⁴ If a business has their employees working on site, OSHA requires

employers to encourage employees to wash their hands, provide hand sanitizer, frequently clean high contact surfaces, and to provide options for high-risk individuals to work from home.²⁵

Since medical data deals with health information, the Health Insurance Portability and Accountability Act (HIPAA) may also apply if the business falls within the HIPAA definition of a “covered entity.”²⁶ Typically, HIPAA violations result in hefty penalties when covered entities wrongfully

²⁰ Employers who are exempt from this are those with “ten or fewer employees at all times during the previous calendar year” and “establishments in certain low-hazard industries are also partially exempt” “Department of Labor Logo UNITED STATESDEPARTMENT OF LABOR.” OSHA’s public website. Accessed January 25, 2021.

<https://www.osha.gov/recordkeeping2014/records.html>.

²¹ “Work-relatedness is presumed for injuries and illnesses resulting from events or exposures occurring in the work environment, unless an exception in §1904.5(b)(2) specifically applies” 1904.5(a) “Department of Labor Logo UNITED STATESDEPARTMENT OF LABOR.” 1904.5 - Determination of work-relatedness. | Occupational Safety and Health Administration. Accessed January 25, 2021. <https://www.osha.gov/laws-regulations/standardnumber/1904/1904.5>.

²² Defined as “an event or exposure in the work environment caused or contributed to the resulting condition” Johnson, Barbara L. *GUIDANCE TO EMPLOYERS ABOUT RETURNING EMPLOYEES TO THE WORKPLACE DURING THE PANDEMIC*, ALI-CLE, 119, no. VCCU0723 (July 23, 2020). pg. 4

²³ 29 CFR §1904.39(a)(2) GUIDANCE TO EMPLOYERS ABOUT RETURNING EMPLOYEES TO THE WORKPLACE DURING THE PANDEMIC, VCCU0723 ALI-CL Johnson, Barbara L. *GUIDANCE TO EMPLOYERS ABOUT RETURNING EMPLOYEES TO THE WORKPLACE DURING THE PANDEMIC*, ALI-CLE, 119, no. VCCU0723 (July 23, 2020). E 119 pg. 5

²⁴ 29 CFR §1904.39(a)(2) Johnson, Barbara L. *GUIDANCE TO EMPLOYERS ABOUT RETURNING EMPLOYEES TO THE WORKPLACE DURING THE PANDEMIC*, ALI-CLE, 119, no. VCCU0723 (July 23, 2020). pg. 5

²⁵ Stephen Miller, CEBS. “Protect the Privacy of Employees with Coronavirus.” SHRM. SHRM, March 18, 2020.

<https://www.shrm.org/resourcesandtools/hr-topics/benefits/pages/protect-the-privacy-of-employees-with-coronavirus.aspx>.

²⁶ “The term ‘covered entity’means an employer, employment agency, labor organization, or joint labor-management committee.” 42U.S.C. 12111(2) “42 U.S. Code § 12111 - Definitions.” Legal Information Institute. Legal Information Institute. Accessed January 25, 2021. <https://www.law.cornell.edu/uscode/text/42/12111>.

disclose protected health information (PHI).²⁷ However, in light of this pandemic, the Department of Health and Human Services (HHS), the enforcement arm of HIPAA, has decided to use more discretion in their enforcement, and assist those who report individuals who have COVID-19 in order to slow down the spread of pandemic.²⁸

There are numerous state laws to consider. For instance, under California's Consumer Privacy Act (CCPA), to avoid penalties, businesses are required to give notice to employees about the data they collect, including medical data.²⁹ If a business does not protect an employee's medical data from unauthorized access, the CCPA may provide statutory relief for an employee.³⁰ Potentially, an additional risk for a California business that screens employees is for the business to not provide sufficient notice at the medical data collection point.

All things considered, there is no *one-size-fits-all* screening method.

A business should select a method that best fits its own needs. Each method has its own potential risks. For example, an onsite screening could actually result in more COVID-19 exposure for a business, while "virtual health checks" may not be as accurate because they rely on each employee properly screening themselves.

From a records management perspective, after the health screening information is no longer necessary for business purposes, a business must consider which disposition steps are to be taken to avoid the potential risk of violating one of these laws. Current retention periods that govern how long medical records should be retained are outlined in state laws; however, they pertain to entities covered by HIPAA. Businesses that are not normally considered entities covered by HIPAA should seek external counsel and consult a records manager before collecting information.

The HIPAA Privacy Rule requires medical documentation to be

²⁷ "Federal Register / Vol. 84, No. 214." U.S. Government Information, November 5, 2019.

<https://www.govinfo.gov/content/pkg/FR-2019-11-05/pdf/2019-23955.pdf>.

²⁸ Burstein, Aaron J. "PRIVACY AND DATA USE IN U.S. GOVERNMENT RESPONSES TO COVID-19." *American Bar Association*, 34-SUM, 41, no. Antitrust (2020). 41 pg. 1

²⁹ "FINAL TEXT OF PROPOSED REGULATIONS." TITLE 11. LAW DIVISION

1. ATTORNEY GENERAL CHAPTER 20. CALIFORNIA CONSUMER PRIVACY ACT REGULATIONS Article 1. GENERAL PROVISIONS. California Attorney General. Accessed January 25, 2021.

³⁰ 1798.150(a)(1)(A) "Bill Text." Bill Text - SB-1121 California Consumer Privacy Act of 2018. Accessed January 26, 2021.

https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB1121

retained by covered entities for six years from the date of the documentation creation or the date when it was last in effect, whichever is later.³¹ If the state retention period is shorter, the HIPAA retention requirement will preempt the state law.³² Also, states may have a longer retention requirement. For example, California requires that patient records be kept for 7 years.³³

Businesses must be vigilant to ensure that health screening programs are implemented in a compliant manner, and that data derived from each screening is retained, protected, and eventually disposed of properly. Businesses should seek guidance from the information governance stakeholders, such as records managers, legal departments, compliance, and IT, when

³¹ Summary of the HIPAA Privacy Rule. Accessed March 1, 2021.

<https://www.hhs.gov/hipaa/for-professionals/privacy/laws-regulations/index.html>

³² Summary of the HIPAA Privacy Rule. Accessed March 1, 2021.

<https://www.hhs.gov/hipaa/for-professionals/privacy/laws-regulations/index.html> 45 C.F.R. §

164.530(j).

³³ Cal. Code Regs. tit. 22, § 70751(c) (2008); This would include those who are vaccinated by a company as the definition of patient in this circumstance is "a person who is receiving diagnostic, therapeutic or preventive health services" Cal. Code Regs., tit. 22, § 70053

³⁴ "What You Should Know About COVID-19 and the ADA, the Rehabilitation Act, and Other EEO Laws." U.S. Equal

determining appropriate level of access and how to securely dispose of the information at the end of the retention period.

III. May a Business Require Their Employees to Be Vaccinated?

With the approval of COVID-19 vaccines, there are questions regarding whether and how the vaccine can be administered to employees. A business may require an employee to provide proof of vaccination.³⁴ There are two types of vaccination programs, on-site and off-site. The CDC recommends that if the organization is a small or mid-sized organization, they have an offsite location.³⁵ The CDC Recommends on-site locations if the organization is large and the employees in the organization have a schedule that is predictable.³⁶

Employment Opportunity Commission. Accessed January 25, 2021.

https://www.eeoc.gov/wysk/what-you-should-know-about-covid-19-and-ada-rehabilitation-act-and-other-eeo-laws?mkt_tok=eyJpIjoiWW1FMk5qaGpOMIZrTUDJNSIsInQiOjJhWXI4OXBHVIJDSGRcL1dMaVVUNzk2RkI6ZFdKRnBKbkp3TG51M3R3OHIOWVJmcVdBQmtHN1ZoanFyNWs1Tk0xdHZ4QVFSZDIwaDMzVIRBemJmaExGd3gxc2c3Zk1tYzQ5UExXNHZZUENVU3NCbG5yN3lsRWNvd240RFJqQVNqMFcifQ%3D%3D

³⁵ "Workplace Vaccination Program" Center for Disease Control and Prevention, March, 25, 2021.

<https://www.cdc.gov/publichealthgateway/healthdirectories/index.html>

³⁶ "Workplace Vaccination Program" Center for Disease Control and Prevention, March, 25, 2021.

Other considerations regarding requiring an employee to be vaccinated is how the ADA applies to the administration of the vaccine. One might ask whether a vaccine is considered a “medical examination” under the ADA. The CDC has indicated that the administration of the vaccine by an employer is not considered a medical examination. A business may, however, run afoul of the ADA by asking employees medical screening questions prior to vaccine administration.³⁷ In certain situations, medical screening questions may reveal information about an employee’s disability to

the employer. Also, if an employer requires proof of vaccination and the employee cannot have the vaccine due to a disability, the question as to why the employee did not take the vaccine could reveal information that potentially violates the ADA.³⁸

The ADA does allow an employer to ask these questions under certain circumstances. If the questions are “job-related and consistent with business necessity,”³⁹ as defined in the ADA, then a business can ask an employee questions which would otherwise be construed as “prohibited examinations and inquiries.”⁴⁰ Another method,

<https://www.cdc.gov/publichealthgateway/healthdirectories/index.html>

³⁷ “What You Should Know About COVID-19 and the ADA, the Rehabilitation Act, and Other EEO Laws.” U.S. Equal Employment Opportunity Commission. Accessed January 25, 2021.

https://www.eeoc.gov/wysk/what-you-should-know-about-covid-19-and-ada-rehabilitation-act-and-other-eeo-laws?mkt_tok=eyJpIjoiWW1FMk5qaGpOMI_ZrTUDJNSIsInQiOjJhWXI4OXBHVlJDSGRcL_1dMaVVUNzk2Rkl6ZFdKRnBkbkp3TG51M3_R3OHIOWVJmcVdBQmtHN1ZoanFyNWs1Tk0xdHZ4QVFSDIwaDMzVIRBemJmaExGd3gxc2c3Zk1tYzQ5UExXNHZZUENVU3NCbG5yN3lsRWNvd240RFJqQVNqMFcifQ%3D%3D.

³⁸ “What You Should Know About COVID-19 and the ADA, the Rehabilitation Act, and Other EEO Laws.” U.S. Equal Employment Opportunity Commission. Accessed January 25, 2021.

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https://www.eeoc.gov/wysk/what-you-should-know-about-covid-19-and-ada-rehabilitation-act-and-other-eeo-laws?mkt_tok=eyJpIjoiWW1FMk5qaGpOMI_ZrTUDJNSIsInQiOjJhWXI4OXBHVlJDSGRcL_1dMaVVUNzk2Rkl6ZFdKRnBkbkp3TG51M3_R3OHIOWVJmcVdBQmtHN1ZoanFyNWs1Tk0xdHZ4QVFSDIwaDMzVIRBemJmaExGd3gxc2c3Zk1tYzQ5UExXNHZZUENVU3NCbG5yN3lsRWNvd240RFJqQVNqMFcifQ%3D%3D.

³⁹ 42 U.S.C. 12112(d)(4)(A) <https://www.govinfo.gov/content/pkg/US-CODE-2018-title42/html/USCODE-2018-title42-chap126-subchapI-sec12112.htm>; Found through “What You Should Know About COVID-19 and the ADA, the Rehabilitation Act, and Other EEO Laws.” U.S. Equal Employment Opportunity Commission. Accessed January 25, 2021.

https://www.eeoc.gov/wysk/what-you-should-know-about-covid-19-and-ada-rehabilitation-act-and-other-eeo-laws?mkt_tok=eyJpIjoiWW1FMk5qaGpOMI_ZrTUDJNSIsInQiOjJhWXI4OXBHVlJDSGRcL_1dMaVVUNzk2Rkl6ZFdKRnBkbkp3TG51M3_R3OHIOWVJmcVdBQmtHN1ZoanFyNWs1Tk0xdHZ4QVFSDIwaDMzVIRBemJmaExGd3gxc2c3Zk1tYzQ5UExXNHZZUENVU3NCbG5yN3lsRWNvd240RFJqQVNqMFcifQ%3D%3D.

⁴⁰ 42 U.S.C. 12112(d)(4)(A) U.S.C. Title 42 - THE PUBLIC HEALTH AND WELFARE.

administered through a business's employee health program,⁴¹ occurs when the administration of the vaccine is completely voluntary, with no negative consequences if the employee does not participate, and if the employee is provided proper notice.⁴² Lastly, the CDC

Accessed January 26, 2021.

<https://www.govinfo.gov/content/pkg/US-CODE-2018-title42/html/USCODE-2018-title42-chap126-subchapI-sec12112.htm>.

⁴¹ "An employee health program, including any disability-related inquiries or medical examinations that are part of such program, must be reasonably designed to promote health or prevent disease. A program satisfies this standard if it has a reasonable chance of improving the health of, or preventing disease in, participating employees, and it is not overly burdensome, is not a subterfuge for violating the ADA or other laws prohibiting employment discrimination, and is not highly suspect in the method chosen to promote health or prevent disease. A program consisting of a measurement, test, screening, or collection of health-related information without providing results, follow-up information, or advice designed to improve the health of participating employees is not reasonably designed to promote health or prevent disease, unless the collected information actually is used to design a program that addresses at least a subset of the conditions identified. A program also is not reasonably designed if it exists mainly to shift costs from the covered entity to targeted employees based on their health or simply to give an employer information to estimate future health care costs. Whether an employee health program is reasonably designed to promote health or prevent disease is evaluated in light of all the relevant facts and circumstances." 29 C.F.R. 1630.14(d)(1).

<https://www.govinfo.gov/content/pkg/CFR-2019-title29-vol4/xml/CFR-2019-title29-vol4-sec1630-14.xml>

states that if the vaccine is administered to employees by an independent third-party not contracted with the employer, the ADA will not be applicable to

<vol4-sec1630-14.xml> Found through "What You Should Know About COVID-19 and the ADA, the Rehabilitation Act, and Other EEO Laws." U.S. Equal Employment Opportunity Commission. Accessed January 25, 2021.

https://www.eeoc.gov/wysk/what-you-should-know-about-covid-19-and-ada-rehabilitation-act-and-other-eeo-laws?mkt_tok=eyJpIjoiWW1FMk5qaGpOMIZrTudJNSIsInQiOjhWXI4OXBHVIJDSGRcL1dMaVVUNzk2Rkl6ZFdkRnBKbkp3TG51M3R3OHIOWVJmcVdBQmtHN1ZoanFyNWs1Tk0xdHZ4QVFSZDIwaDMzVIRBemJmaExGd3gxc2c3Zk1tYzQ5UExXNHZZUENVU3NCbG5yN3lsRWNvd240RFJqQVNqMFcifQ%3D%3D.

⁴² Requirements for compliant notice: "(A) Is written so that the employee from whom medical information is being obtained is reasonably likely to understand it;(B) Describes the type of medical information that will be obtained and the specific purposes for which the medical information will be used; and(C) Describes the restrictions on the disclosure of the employee's medical information, the employer representatives or other parties with whom the information will be shared, and the methods that the covered entity will use to ensure that medical information is not improperly disclosed (including whether it complies with the measures set forth in the HIPAA regulations codified at 45 CFR parts 160 and 164)." 29 C.F.R. 1630.14(d)(iv)

<https://www.govinfo.gov/content/pkg/CFR-2019-title29-vol4/xml/CFR-2019-title29-vol4-sec1630-14.xml>

medical questions asked in a pre-screening.⁴³

Another law the CDC indicates may be at risk of being violated, the Genetic Information Nondiscrimination Act (GINA), forbids “employers from requesting, requiring, or purchasing genetic information about an individual.”⁴⁴ As one can imagine, this law might be violated in the pre-screening process if an

employee is asked about their family medical history, or other genetic information, prior to the administration of a vaccination, which therefore implicates a request for genetic data.⁴⁵ Selecting pre-screening questions wisely and avoiding the inclusion of genetic information is something of which a business must be aware if they are screening their employees prior to administering a vaccination.⁴⁶ If the business

⁴³ “What You Should Know About COVID-19 and the ADA, the Rehabilitation Act, and Other EEO Laws.” U.S. Equal Employment Opportunity Commission. Accessed January 25, 2021. https://www.eeoc.gov/wysk/what-you-should-know-about-covid-19-and-ada-rehabilitation-act-and-other-eeo-laws?mkt_tok=eyJpIjoiWW1FMk5qaGpOMIZrTUDJNSIsInQiOjHwXI4OXBHVlJDSGRcL1dMaVVUNzk2Rkl6ZFdKRnBKb kp3TG51M3R3OHIOWVJmcVdBQmtHN1ZoanFyNWs1Tk0xdHZ4QVFSZDIwaDMzVIRBemJmaExGd3qxc2c3Zk1tYzQ5UExXNHZZUENVU3NCbG5yN3lsRWNvd240RFJqQVNqMFcifQ%3D%3D.

⁴⁴ Issuing Authority This guidance document was issued upon approval of the Chair of the U.S. Equal Employment Opportunity Commission., and This guidance document was issued upon approval of the Chair of the U.S. Equal Employment Opportunity Commission. “Fact Sheet: Genetic Information Nondiscrimination Act.” Fact Sheet: Genetic Information Nondiscrimination Act | U.S. Equal Employment Opportunity Commission. Accessed January 26, 2021. <https://www.eeoc.gov/laws/guidance/fact-sheet-genetic-information-nondiscrimination-act#:~:text=Title%20II%20of%20the%20Genetic,the%20basis%20of%20genetic%20information.&text=It%20also%20applies%20to%20employment,programs%2C>

[%20and%20the%20federal%20governme nt.](https://www.eeoc.gov/wysk/what-you-should-know-about-covid-19-and-ada-rehabilitation-act-and-other-eeo-laws?mkt_tok=eyJpIjoiWW1FMk5qaGpOMIZrTUDJNSIsInQiOjHwXI4OXBHVlJDSGRcL1dMaVVUNzk2Rkl6ZFdKRnBKb kp3TG51M3R3OHIOWVJmcVdBQmtHN1ZoanFyNWs1Tk0xdHZ4QVFSZDIwaDMzVIRBemJmaExGd3qxc2c3Zk1tYzQ5UExXNHZZUENVU3NCbG5yN3lsRWNvd240RFJqQVNqMFcifQ%3D%3D.)

⁴⁵ “What You Should Know About COVID-19 and the ADA, the Rehabilitation Act, and Other EEO Laws.” U.S. Equal Employment Opportunity Commission. Accessed January 25, 2021.

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⁴⁶ “What You Should Know About COVID-19 and the ADA, the Rehabilitation Act, and Other EEO Laws.” U.S. Equal Employment Opportunity Commission. Accessed January 25, 2021.

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cannot omit pre-screening questions concerning genetic information, the CDC recommends that a business not administer the vaccine themselves, but rather verify that the employee was vaccinated.⁴⁷ If documentation of this verification is made, businesses should consult with legal counsel and adhere to appropriate records retention schedule as discussed in the "How Should Health Screenings Be Administered and Recorded?" section of this article.

Businesses providing a vaccine to its employees through a health program may be considered a "health plan"⁴⁸ as defined in HIPAA, and therefore the program

⁴⁷ "What You Should Know About COVID-19 and the ADA, the Rehabilitation Act, and Other EEO Laws." U.S. Equal Employment Opportunity Commission. Accessed January 25, 2021.

⁴⁸ *Health plan* means an individual or group plan that provides, or pays the cost of, medical care (as defined in section 2791(a)(2) of the PHS Act, 42 U.S.C. 300gg-91(a)(2)).

https://www.law.cornell.edu/cfr/text/45/1_60.103.

⁴⁹ "The term 'covered entity' means an employer, employment agency, labor organization, or joint labor-management

may be considered a "covered entity."⁴⁹ The result is that HIPAA compliance must be strictly adhered to in this situation, or as indicated above, there could be large penalties for noncompliance.⁵⁰

If a business requires the vaccination of its employees and an employee cannot take the vaccine because of a disability or a religious belief, the business must first try to reasonably accommodate the employee.⁵¹ If there is no reasonable accommodation available for the employee, and the unvaccinated employee creates a "direct threat"⁵² as defined under the ADA, the business can prevent an

committee." 42U.S.C. 12111(2) <https://www.law.cornell.edu/uscode/text/42/12111>

⁵⁰ "Federal Register / Vol. 84, No. 214." U.S. Government Information, November 5, 2019. <https://www.govinfo.gov/content/pkg/FR-2019-11-05/pdf/2019-23955.pdf>.

⁵¹ "What You Should Know About COVID-19 and the ADA, the Rehabilitation Act, and Other EEO Laws." U.S. Equal Employment Opportunity Commission. Accessed January 25, 2021.

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⁵² 29 C.F.R. 1630.2(r), "Direct Threat" means a significant risk of substantial

employee from entering its premises.⁵³ Even though an employer can prevent an employee from entering their premises, the business cannot necessarily terminate the employment of the employee, due to other federal or local laws that may provide further protections to the employee.⁵⁴ One now common accommodation is to

have the employee work from home.

It is important for a business to develop and document their plan as to how they will implement vaccinations and consult with counsel about state and local laws. Furthermore, there can be an issue if the business wrongfully terminates an employee for not

harm to the health or safety of the individual or others that cannot be eliminated or reduced by reasonable accommodation. The determination that an individual poses a "direct threat" shall be based on an individualized assessment of the individual's present ability to safely perform the essential functions of the job. This assessment shall be based on a reasonable medical judgment that relies on the most current medical knowledge and/or on the best available objective evidence. In determining whether an individual would pose a direct threat, the factors to be considered include:(1) The duration of the risk;(2) The nature and severity of the potential harm;(3) The likelihood that the potential harm will occur; and (4) The imminence of the potential harm." Found At:

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[3qxc2c3Zk1tYzQ5UExXNHZZUENVU3NCbG5yN3lsRWNvd240RFJqQVNqMFcifQ%3D%3D](https://www.eeoc.gov/wysk/what-you-should-know-about-covid-19-and-ada-rehabilitation-act-and-other-eeo-laws?mkt_tok=eyJpIjoiWW1FMk5qaGpOMIZrTUDJNSIsInQiOjJhWXI4OXBHVlJDSGRcL1dMaVVUNzk2Rkl6ZFdkRnBKbkp3TG51M3R3OHIOWVJmcVdBQmtHN1ZoanFyNWs1Tk0xdHZ4QVFSZDIwaDMzVIRBemJmaExGd3qxc2c3Zk1tYzQ5UExXNHZZUENVU3NCbG5yN3lsRWNvd240RFJqQVNqMFcifQ%3D%3D).

⁵³ "What You Should Know About COVID-19 and the ADA, the Rehabilitation Act, and Other EEO Laws." U.S. Equal Employment Opportunity Commission. Accessed January 25, 2021.

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⁵⁴ "What You Should Know About COVID-19 and the ADA, the Rehabilitation Act, and Other EEO Laws." U.S. Equal Employment Opportunity Commission. Accessed January 25, 2021.

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being vaccinated if the law protects the employee.

If a business is requiring employees to be vaccinated, the risks of violating laws and regulations are not entirely related to the administration of the vaccine itself, but, rather, in the notice given, the questions asked of the employee, and the retention of any documents a business might collect. This includes any medical questions asked of the employee prior to vaccination and the questioning of why an employee did not get vaccinated.

IV. Conclusion

Limiting or steering clear of unnecessary collection and/or retention of employee medical data during the COVID-19 pandemic is likely the best practice for businesses to reduce potential legal or regulatory hurdles. For businesses that see a need for the collection and subsequent retention of employee medical data for the purposes of protecting employees in the workplace, it is important to know and understand the applicable rules and regulations while working with employment counsel.

First, the business should seek legal counsel to understand what state and local laws, such as medical, employment, or privacy laws, apply and comply with those laws. It is critically important to consider some laws that might be implicated may not be obvious,

and that there may be other regulatory standards to maintain as well. Second, a business should use a method that integrates well with its operational goals and will safely test employees for COVID-19 symptoms. Then, if an employee has COVID-19, a business should discreetly inform others who may have been potentially exposed, in such a way that will keep identities confidential. Third, if a business is going to require its employees to be vaccinated, the business needs to be careful as to how it chooses to administer the vaccine, as well as its response to those who cannot take the vaccine for medical or religious belief reasons. Fourth, all businesses should ensure that a well-managed, defensible records retention and disposition policy is instituted to ensure a reliable plan for the collection, use and access, retention, and disposition of the records. Fifth, businesses should collect input from stakeholders, Human Resources, and related information governance areas, such as records management, legal, privacy, information security, data management, and information technology departments. Businesses that adhere to the guidance advised above, and ensure that appropriate stakeholders are advised, will keep risk to a minimum during the COVID-19 pandemic, while simultaneously respecting employee medical data privacy and compliance with applicable laws, and regulations.

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“Never Waste a Crisis”: A Holistic Approach to Privacy, Transparency and Secrecy for Records Resilience

Darra Hofman, PhD, JD, MSL

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Introduction

While change has always been part of the human condition – Benjamin Franklin wrote that “nothing can be said to be certain, except death and taxes” in 1789 – the recent pace of change has been breathtaking. From technological advances, such as blockchain, big data analytics, and artificial intelligence, to a global pandemic, the existential threat of climate change, historic economic disruption and sweeping social and political changes, it is difficult, if not impossible, to imagine what waits around the corner, much less beyond the horizon. What is certain, however, is that resilience, that remarkable capacity of individuals, communities, and organization to face up against and overcome difficulty, will be necessary.

One aspect of records and information management (RIM) that has proven challenging due to technological and social change, even prior to the present moment of crisis, has been appropriately managing access – finding the balance between privacy, transparency, and secrecy. Drawing such a balance, however, remains perpetually difficult.

Determining whether to favour privacy, transparency, or secrecy with regards to given records requires deciding what values and actions would be enabled (or constrained) by disclosure, and what countervailing risks exist. In the age of climate change and COVID-19, the balance has become even more tenuous, as information is needed to research climate impacts and trace contacts, but the impacts of generous or even indiscriminate disclosure fall unevenly, posing very real risks to everyone, but disproportionately to vulnerable and/or marginalized people.

Despite these challenges, organizations and communities must find ways to make decisions balancing privacy, transparency, and secrecy. To do otherwise is to undermine the resilience of information management and of the organization or community itself – exposing itself to litigation, limiting the availability of information necessary for good decision making, or even risking the very safety of the organization or community. This article presents a framework for examining decisions balancing privacy, transparency, and secrecy with regards to digital records systems;

because the framework is holistic and not prescriptive, it is a flexible means of approaching these decisions that can help support records and information management resilience.

Design/methodology/approach

While this paper does not detail the studies, the development of the framework drew upon doctrinal legal research examining privacy and transparency laws in the United States and Canada, a critical interpretive synthesis of the literature concerning privacy, transparency, and secrecy, a case study examining information privacy and transparency in the design of a blockchain system, a document analysis of the privacy policies of a purposive sample of archival institutions, and a focus group with records professionals focused on privacy in their work. Details of the studies can be found in the author's doctoral dissertation¹.

Results

This study found that decisions balancing privacy and transparency are difficult largely because each of the competing concepts serves an "umbrella construct,"² a "broad concept used to encompass and

¹ Darra Hofman, "'Between Knowing and Not Knowing': Privacy, Transparency and Digital Records," 2020, <https://doi.org/10.14288/1.0391887>.

² Ethan S. Bernstein, "Making Transparency Transparent: The Evolution

of Observation in Management Theory," *Academy of Management Annals* 11, no. 1 (2017): 217–66, <https://doi.org/10.5465/annals.2014.0076>.

account for a diverse set of phenomena”³. Furthermore, it found that records and information management (RIM) is inseparably bound to decision making about privacy, transparency, and secrecy: good RIM practices are necessary to enable (or constrain) appropriate access, while a number of contextual factors (including the juridical, administrative, and technological contexts) of the records and information under consideration condition the range of potential choices to be made. This study also found that each of the constructs under consideration – privacy, transparency, and secrecy – can serve as pro-ethical conditions; by favouring, for example, privacy, one can enable (or constrain) certain values, such as autonomy or dignity, or certain actions, such as belief formation or identity formation. It also found surprising areas of overlap: both privacy and transparency can, in the correct context, support outcomes autonomy.

Defining Privacy and Transparency

This study began with the goal of understanding the relationship between privacy and transparency. It quickly became apparent that one of the primary challenges in balancing privacy and transparency

in providing access to records is the enormous breadth of each term.

There are four major lines of argumentation around privacy: privacy as right, privacy as privilege, privacy as relationship, and privacy as identity. Each line is extensive and complex, and often contradicts the others, yet we cannot ignore any in our privacy decision making. This is why a compliance-oriented approach is necessary but insufficient for appropriate access decisions; a rights-oriented approach can easily miss the importance of privacy to maintaining relationships in spaces that are not protected by legislation. Indeed, given that “social support, including relationships with family and peers, is correlated with resilience,”⁴ a rights-only approach to privacy decisions could easily serve to undermine the resilience of individuals or even entire communities, depriving them of the privacy that relationships require. A compliance-only approach also risks compounding the injustices of privacy as privilege, further straining communities that disproportionately bear the

³ Paul M. Hirsch and Daniel Z. Levin, “Umbrella Advocates Versus Validity Police: A Life-Cycle Model,” *Organization Science* 10, no. 2 (1999): 199–212, <https://doi.org/10.1287/orsc.10.2.199>.

⁴ Helen Herrman et al., “What Is Resilience?,” *The Canadian Journal of Psychiatry* 56, no. 5 (May 2011): 258–65, <https://doi.org/10.1177/070674371105600504>.

burdens of climate change⁵, the pandemic⁶, and economic and social dislocation. As early as 1973, the U.S. Department of Health, Education, and Welfare identified that computerized recordkeeping imposed "the danger that some recordkeeping applications of computers will appear in retrospect to have been oversimplified solutions to complex problems, and that their victims will be some of our most disadvantaged citizens."⁷ In each of these different modes, privacy serves to enable (or constrain) different ethical values, such as autonomy or community, and different actions, such as decision making.

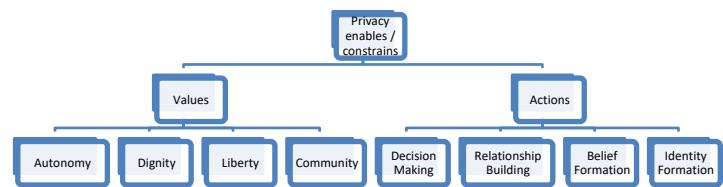


Figure 1: Values and actions enabled/constrained by privacy, originally from author's doctoral dissertation

Transparency is no simpler. It functions as a (self-contradictory) metaphor, a means of control, and a means of accountability. Offered, variously, as a panacea for the ills of corruption⁸ and a totalizing,

⁵ Charmian Bennett and Sharon Friel, "Impacts of Climate Change on Inequities in Child Health," *Children* 1, no. 3 (December 3, 2014): 461–73, <https://doi.org/10.3390/children1030461>; Paul English et al., "Racial and Income Disparities in Relation to a Proposed Climate Change Vulnerability Screening Method for California," *The International Journal of Climate Change: Impacts and Responses* 4, no. 2 (2013): 1–18, <https://doi.org/10.18848/1835-7156/CGP/v04i02/37156>; Kim van Daalen et al., "Climate Change and Gender-Based Health Disparities," *The Lancet Planetary Health* 4, no. 2 (February 2020): e44–45, [https://doi.org/10.1016/S2542-5196\(20\)30001-2](https://doi.org/10.1016/S2542-5196(20)30001-2).

⁶ Emily Wiemers et al., "Disparities in Vulnerability to Severe Complications from COVID-19 in the United States" (Cambridge, MA: National Bureau of Economic Research, June 2020), <https://doi.org/10.3386/w27294>; Merlin Chowkwanyun and Adolph L. Reed, "Racial Health Disparities and Covid-19 — Caution

and Context," *New England Journal of Medicine* 383, no. 3 (July 16, 2020): 201–3, <https://doi.org/10.1056/NEJMp2012910>; Laura Montenovo et al., "Determinants of Disparities in Covid-19 Job Losses" (Cambridge, MA: National Bureau of Economic Research, May 2020), <https://doi.org/10.3386/w27132>; Yelena Rozenfeld et al., "A Model of Disparities: Risk Factors Associated with COVID-19 Infection," *International Journal for Equity in Health* 19, no. 1 (December 2020): 126, <https://doi.org/10.1186/s12939-020-01242-z>.

⁷ U.S. Department of Health, Education, & Welfare, "Records, Computers and the Rights of Citizens: Report of the Secretary's Advisory Committee on Automated Personal Data Systems," 1973, <https://www.justice.gov/opcl/docs/rec-com-rights.pdf>.

⁸ Carolyn Ball, "What Is Transparency?," *Public Integrity* 11, no. 4 (2009): 293–308, <https://doi.org/10.2753/PIN1099-9922110400>.

terrorizing, pornographic ideology,⁹ transparency is best understood in the context of records due to its accountability function. However, transparency – providing access – can enable/constrain a number of values and actions, just as privacy does. Consider Figure 2 below, which shows transparency's enormous sweep from autonomy to surveillance:

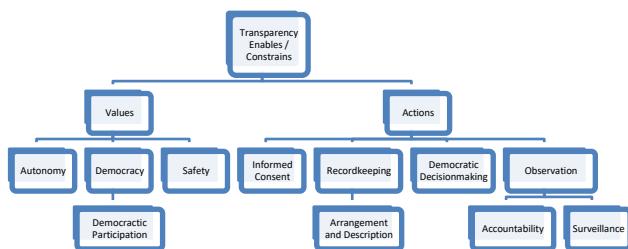


Figure 2: Values and actions enabled/constrained by transparency, originally from author's doctoral dissertation

Identifying the need for secrecy

Through the course of the research, it became clear that a third category beyond privacy and transparency was necessary: secrecy. Secrecy has not had the same cachet as privacy and transparency as it is associated with dark dealing and evildoing. Conflating secrecy and privacy, however, misdirects access

decisions, as the two concepts encompass different values and different societal needs. As critical as privacy is, the ancient *arcana imperii* – state secrets – remain, even in modern democracies, a necessity:

democratic countries can legitimately require secrecy, for example, when fundamental and collective interests, such as national security, demand it. However, these situations can only exist when secrecy is not used as an instrument to hide government wrongdoings and when there is no alternative way to guarantee the security of intelligence agents and the rights of victims.¹⁰

Secrecy, not privacy, is what vexes the design of the duty to document; decision makers need some secrecy in which to make decisions and conduct the business of government; even within his Panopticon, Bentham provided secret spaces for the Ministers of Government to meet and work. Access decisions, then, must consider secrecy, which enables (or constrains) a unique set of values and actions in governance such as safety and deliberation/decision

⁹ Byung-Chul Han and Erik Butler, *The Transparency Society* (Stanford, California: Stanford Briefs, an imprint of Stanford University Press, 2015).

¹⁰ Arianna Vedaschi, "The Dark Side of Counter-Terrorism: Arcana Imperii and

Salus Rei Publicae," *The American Journal of Comparative Law* 66, no. 4 (2018): 877–926, <https://doi.org/10.1093/ajcl/avy049>.

making, as shown in Figure 3 below.

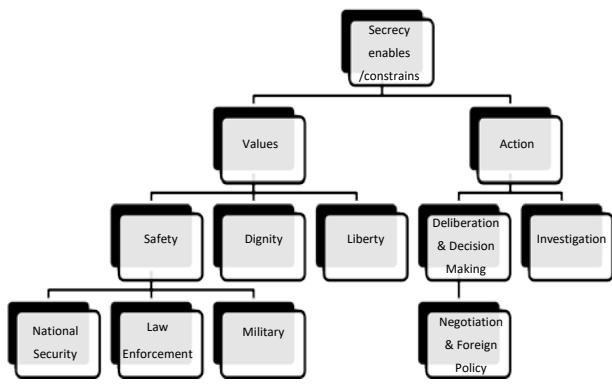


Figure 3: Values and Actions Enabled or Constrained by Secrecy, originally from author's doctoral dissertation

Records and information management: A key to balancing privacy

A major finding of this research was the central role that RIM plays in decisions balancing privacy, transparency, and secrecy. Coding a sample of privacy policies for the practices and approaches that organizations use to try to meet their privacy goals makes clear that records, records management, and archival practice are central to access management. Indeed, the document analysis of privacy policies found four major categories of Practices and Approaches into which organizations' approaches to privacy management could be organized: Archival Functions and Practices, Information Governance, Organizational Approaches, and Privacy-Specific Practices and Approaches, as shown in Figure 4

below. The analysis reveals a technology-neutral approach that centers leadership (it appears, variously, as "Leadership and Management," "Leadership," and "Authority and Responsibility") and coordination across units and disciplines within an organization or institution. Privacy and transparency policies, then, appear to contemplate the integration of good records practice throughout the organization and institution.

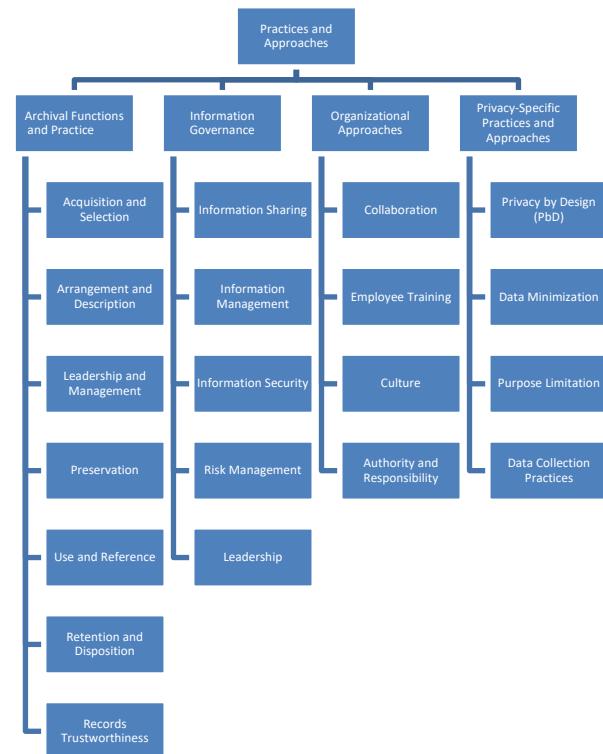


Figure 4: Practices and approaches that support good privacy decision making, originally from author's doctoral dissertation

Additionally, privacy, transparency, and secrecy are all enabled (or constrained) by the quality of recordkeeping. Figure 5, below, shows that privacy is

enabled/constrained by both practices – including recordkeeping, and contextual factors, including information/communication infrastructures. The ability to choose between privacy, transparency, and secrecy in a value- and action-oriented way can be limited or even completely eliminated without good RIM practices; the critical records might be unavailable or untrustworthy, or might be made inappropriately accessible.

:

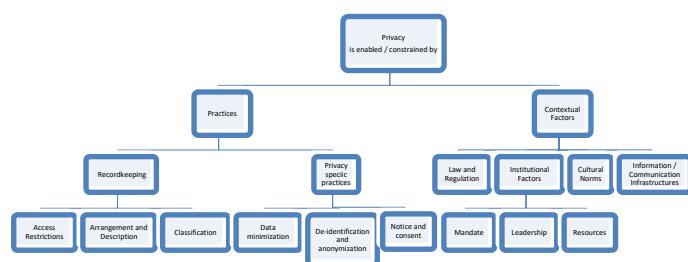


Figure 5: Factors enabling or constraining privacy, originally from author's doctoral dissertation

Moreover, this study found that our legal, social, and ethical norms around information access have arisen in a *recordified*, rather than *datafied* way. "In the digital era,

we still need records that have the power to underwrite accountability, to testify to past events and statements, and to sustain rights, obligations, agreements and commitments."¹¹ *Records*, not data, in large part because our notions of both privacy and transparency have arisen concurrently with our use of records and recordkeeping as social technologies. Even when memorialized in bits, records remain fundamentally bound up in human action and the systems – juridical, cultural, social – in which human action occurs. Indeed, what modern privacy scholars might call the "contextual integrity"¹² of a record are often bound up in the record itself.

Discussion

*Where the problem is relatively simple, as it is apt to be when private interests only are involved, it generally proves adequate. But with the increasing complexity of society, the public interest tends to become omnipresent, and the problems presented by new demands for justice cease to be simple.*¹³

¹¹ Geoffrey Yeo, Yeo, and Cambridge Core EBA eBooks Complete Collection, *Records, Information and Data: Exploring the Role of Record Keeping in an Information Culture*, Book, Whole (Facet Publishing, 2018), <https://doi.org/10.29085/9781783302284>.

¹² Helen Fay Nissenbaum, *Privacy in Context: Technology, Policy, and the Integrity of Social Life*, Book, Whole (Stanford, Calif: Stanford Law Books, 2010).

¹³ J. Brandeis (dissenting), *International News Service v. Associated Press*, 248

Brandeis' dissent captures the challenge that faced the Supreme Court of the United States in 1918 in drawing the public/private boundary in so complex a society. It would seem Brandeis' challenge is also ours. How do we create space for the private in the face of an "omnipresent public interest?" How do we avoid talking in endless circles or chasing down rabbit holes in making these decisions? In short, appropriate analysis of complex or contested questions of privacy and transparency in the digital records environment – be they at the level of a file or of an institution – requires understanding the contexts in which those questions arise and the goals and needs of the stakeholders implicated. Rather than focusing on "privacy" versus "transparency" versus "secrecy," the questions must be framed as: What are our purposes here? What ethical principles do we seek to serve in releasing (or restricting) specific records? What can be done with those records? Who will be helped, or harmed, in what ways, and in what proportions? *Qui bono?* These questions are of necessity limited by the context in which they arise: One cannot favour transparency if the necessary records are unavailable, nor should decisions be taken in violation of law. After accounting for the organizational practices and

contextual factors in which the decision must be taken, concrete questions about the values and actions that each approach enables can then support the decision to provide or deny access.

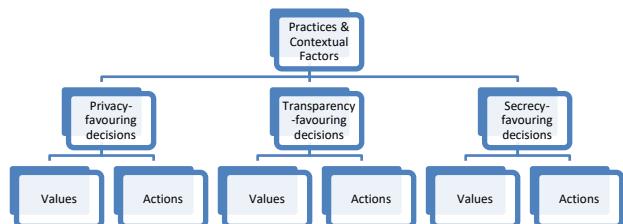


Figure 6: The flow of decisions surrounding privacy, transparency, and secrecy, originally from author's doctoral dissertation

These frameworks might seem frustratingly broad; they do not provide a "correct" answer to any given access question. They also capture practices followed by a number of RIM professionals, though perhaps not formalized as such. However, particularly when deciding edge cases – those extreme cases where systems can fail, sometimes catastrophically – RIM professionals are asked to carry a tremendous burden, asked to weigh, for example, problems of dignity versus accountability. There is a maxim that "hard cases make bad law," and so it is with trying to generalize from complicated, fact-driven decisions to general principles. This framework offers a lens to approach problematic cases individually, with an eye to the

specific values and actions we would enable (or constrain) by providing or denying access. Our access decisions become more resilient when we have concrete discussions about the contingent, fraught, messy human work that still underlies records and their creation, use, preservation, and disposition.

The Frameworks in Action: COVID-19

COVID-19, which has forced so much of life online, and brought forth new forms of surveillance including contact tracing and immunity passports, has given us a number of hard cases to consider. While a full discussion is beyond the scope of this paper, the example of contact tracing illustrates how the framework plays out. We must begin with Practices & Contextual Factors, as they limit the possible choices. For example, in examining the provenance of the information collected, it matters whether it's GPS or Bluetooth in determining if people were social distancing: "cell tower and GPS data typically have margins of error of more than 6 feet. GPS data [...] is usually accurate only to within 16 feet [...] Bluetooth tracking may be more precise, but it is also overinclusive, likely registering contacts between devices despite the presence of

walls."¹⁴ Which margin of error – if either – is acceptable for decision making? If we decide, in pursuit of the value of safety, to make contact tracing data available for epidemiological study, knowing the technological context will be necessary to interpret the data correctly. If the technological context (GPS/Bluetooth) is simply not recorded, then any decisions about the app's data will have to be made in light of the fact that we lack the means to judge whether the data is imprecise or overinclusive. That aspect of information quality impacts the analysis as to whether access (in support of safety), privacy (in support of the dignity of individuals or communities), or even secrecy (to provide room for public health officials to make decisions about an outbreak, for example) should carry the day.

Of course, that's just one small contextual factor. A number of other practices and contextual factors determine the trustworthiness of the app's information. How – and by whom – are the records and information associated with the app controlled? What jurisdiction is the app associated with? Illegal is illegal, after all. Does the app collect data promiscuously, making it that much more likely that individuals can be re-identified? How well can

¹⁴ Natalie Ram and David Gray, "Mass Surveillance in the Age of COVID-19," *Journal of Law and the Biosciences* 7, no.

1 (July 25, 2020): lsaa023,
<https://doi.org/10.1093/jlb/lsaa023>.

we trace the provenance of the information? The answers to these questions lay the groundwork in which our privacy/transparency/secrecy decisions must be made. If we cannot prove the provenance – and thus trustworthiness – of the app’s data, for example, no appeal to accountability can be justified as grounds for making the data accessible. The better the quality of RIM associated with the app, the more options we have available. In the absence of quality RIM, balancing privacy, transparency, and secrecy is increasingly difficult, because the decisions are predicated not just on the values and actions that we want to take, but on whether we can justifiably restrict or share particular information due to its trustworthiness for the purpose. If we have trustworthy data, we can then decide that, for example, the values of autonomy and dignity should triumph over the safety gains to be made by providing COVID surveillance data for future research. But it is only when the records and information gathered are of sufficient quality that we can focus our decision making on the questions of values and actions at the heart of these challenges.

Conclusion

Rather than providing simple solutions, digital technologies have entrenched questions of access as a wicked problem, but one that is imbued with much more hope, and many more approaches than the much-touted “privacy is dead” mantra. Privacy, transparency, and secrecy are complex, multifaceted concepts at the heart of what it means to be human, engaging questions as big as “How does one live as an autonomous individual while also living in community?” Records – and records professionals – have a critical role to play in navigating these questions in both our current and future digital environments. Ultimately, the conversation about privacy and transparency in the digital records environment is only beginning; the ways in which decisions have been made about access, restriction, and use in the datafied paradigm have, as Hildebrandt asserts, largely obscured critical ethical questions as “tacit, invisible interpretations.”¹⁵ Ensuring appropriate access to (and restrictions on) records and information will prove essential to the resilience of organizations and communities. Good RIM is a necessary precondition to being able to do so, and records and

¹⁵ Mireille Hildebrandt, *Smart Technologies and the End(s) of Law* *Novel Entanglements of Law and Technology* (Cheltenham, UK: Edward Elgar Publishing, 2015), <https://www.elgaronline.com/view/978149808767.xml>.

information professionals must be at the table when decisions about privacy, transparency, and secrecy are made. Furthermore, decisions about privacy, transparency, and secrecy are decisions about values and actions, and must be understood at that level, and not in terms of the broader umbrella constructs, which both conflict and overlap. However, there is reason for optimism: both in supporting and making decisions regarding privacy, transparency, and secrecy, the RIM profession has already shown adaptability and resilience, as Terry Cook's four archival paradigms of memory, evidence, identity, and community all emerge in these decisions, pointing to a profession that can "harbor plurality, diversity, and difference,"¹⁶ which is critical to both surviving and thriving through our uncertain future.

¹⁶ Terry Cook, "Evidence, Memory, Identity, and Community: Four Shifting Archival Paradigms," *Archival Science* 13,

no. 2 (2013): 95–120,
<https://doi.org/10.1007/s10502-012-9180-7>.

The Importance of AI and Semantic Approaches to Information Retrieval for COVID-19 Literature

Petar Veljko, Smart Info Management Service

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I) Introduction

The events in 2020 have saliently affected the understanding of crisis management according to established principles and concepts in information science and management. The COVID-19 pandemic as a focal point to this study, has proven to be a prime example of a crisis which demonstrates the importance of information retrieval for existing platforms when adhering to the information needs and behaviour of the public. The beginning of the COVID-19 crisis in 2020 coincided with the rapid emergence of COVID-19 related information in search engines and social media platforms. The inordinate dissemination of information to the public with the inclusion of inaccurate or false information generated new terminologies and a new field of study which focalizes on this phenomenon. Authors for

the Journal of Medical Internet Research held a consultative meeting with the World Health Organization (WHO) to discuss ideas on how to address the current coronavirus disease (COVID-19) infodemic. The term "infodemic" became declared officially by the WHO Director-General on February 15, 2020ⁱ. The term was originally coined two decades prior by the Editor of the Journal of Medical Internet Research who also employed the terms "infodemiology" and "infoveillance"ⁱⁱ. The WHO defines an infodemic as:

"An over-abundance of information – some accurate and some not – that makes it hard for people to find trustworthy sources and reliable guidance when they need it"ⁱⁱⁱ.

As Naeem and Bhatti state further:

"The abundance of information on social media frequently makes it difficult for an individual to distinguish between what are facts, and what are opinions, propaganda or biases"^{iv}.

The COVID-19 infodemic has posed new challenges for both information seekers and

professionals who contend with developments in artificial intelligence. Artificial intelligence or AI is a thriving promising technology with a diverse range of applications for various industries and sectors. The main branches of AI, which this review will examine, include Machine Learning (ML), Deep Learning (DL) and Natural Language Processing (NLP). ML is a branch of AI, applied to various algorithms and systems, which is capable of learning and extracting meaningful patterns in data. DL enables a system to learn the right representations from data in a deep manner which refers to the application of multiple sequential layers for enhanced learning and for solving complex systems^v. NLP refers to the extraction of meaning from text including text from large datasets to retrieve accurate information and is often dependent upon ML approaches for these intended purposes. NLP is a tool that is often utilized for drug discovery and development as well as for the information retrieval of biomedical content^{vi}.

One of the challenges which relates closely to the subject of AI is the overload of potential information which is disseminated to the public during a period of crisis^{vii}. The purposes of this research warranted the comparative assessment and evaluation of the tools and applications of AI in their design to manage and mitigate the concurrent challenges of the

infodemic when pertaining to the retrieval of verifiably accurate scientific information.

The objectives of this research were to review, examine and assess the relationship between emergent developments in artificial intelligence and the management of the infodemic's vast, abundant digital information in the context of the needs of health workers, researchers and policy makers as a distinctive group of information seekers; with respect to the correlative relationship between the functions of AI and the dissemination of digital information about COVID-19, to determine what applications of AI had been adapted specifically for the information retrieval of recent scientific literature about COVID-19 in 2020 and to assess how semantic approaches aligned with AI functions may help to improve this process by mirroring the queries of searchers using applicable search engines, tools and platforms.

II) Methodologies

For the purposes of this research, a literature review of the available academic literature in 2020 on the relationship of AI with COVID-19 information retrieval was conducted using a varied set of applicable keywords. These keywords included "COVID-19", "infodemic", "Infodemiology", "information retrieval", "AI", "Machine Learning", "Deep

Learning”, and “Natural Language Processing”. The terms “semantic search” and “semantic tools” were supplementarily utilized for more in-depth research into the specific functionalities of semantic systems and tools for COVID-19 information retrieval.

Exclusion criteria was developed for this research study to exclude articles which did not mention Infodemic/Infodemiology or information retrieval about COVID-19 upon the assessment of abstracts and full texts. The intent of this criteria was to highlight articles which discuss applications of AI for information retrieval and semantic approaches including semantic methodologies, systems, and concepts. A literature search for peer-reviewed journal articles, theses and conference proceedings was conducted with the use of the following databases: Pubmed, ScienceOpen, Google Scholar, IEEE Xplore and Semantic Scholar. As this literature search was performed before February 2021, the research for this review explores the literature published between January and December 2020.

III) Results

The results of the literature search disclosed several findings which gave context to any assessment of the relationship between developments in AI and how information is retrieved for the specific purposes in this study.

First, upon searching with the keywords AI, artificial intelligence, COVID-19, Infodemic, and information retrieval, many of the retrieved articles, theses and conference proceedings reflected the increasing utilization of the applications of AI for the crisis management of COVID-19 irrespective of infodemic management. For epidemiology, AI can improve early warning systems, modelling of empirical data, public policy interventions and numerous epidemiological techniques. The contingency of AI applications on the extraction of data had prompted various data-sharing initiatives around COVID-19 to promote cooperation among international, national, and local levels including initiatives in open science that had been supported by AI partnerships^{viii}. Several results discussed these applications in the context of search engines and social media networks where public information is disseminated. Bullock et al describe the extent to which the infodemic affects scientific research given the output of scientific articles relating to COVID-19 with further emphasis on the need to critically assess the vast body of scientific literature with the adoption of AI and ML research^{ix}.

The global response to COVID-19, including the challenges of the Infodemic, mandate the increasing need for cooperation between practitioners and the AI community

so the AI community may continue to seek more advice and guidance from domain experts, including government officials, healthcare professionals, and first responders^x.

As Luccioni et al note, AI had been applied to investigate the scale of the infodemic to address the propagation of misinformation and disinformation and analyze patterns in the transmission of such information and develop infodemic risk scoring algorithms^{xi}. AI based methods had been adopted to fill the health information gaps for individuals and policymakers for a more comprehensive, evidence-based societal response to the crisis. With respect to information retrieval, a review of the current literature according to aforementioned criteria had presented important findings concerning both AI applications and semantic approaches based on relevant commercial and non-commercial tools and systems which point to recent developments in these processes.

Naude et al, discuss the initiatives in AI which had been started to gather and share both existing and new data for new AI Models. These models include the WHO Global Research on Corona-virus Disease Database and the open access data initiative of the GISAID Initiative (formerly the Global Initiative on Sharing All Influenza Data). The most ambitious initiative

commenced between Semantic Scholar, the Allen Institute for Artificial Intelligence, Microsoft, Facebook, and others, to make openly available the COVID-19 Open Research Dataset (CORD-19)^{xii}. CORD-19 is a resource of scientific literature on COVID-19 which consists of a rich collection of metadata and structured full text articles. CORD-19 is significant in that it is a resource which serves to facilitate text mining and information retrieval systems with its vast body of information. This resource was initiated in order to connect the machine learning community with biomedical domain experts and policy makers in the goals of identifying effective treatments and management policies including the management of the overabundance of information also referred to as infodemic management^{xiii}.

This systematic initiative to consolidate information (mostly in the form of scientific articles) in the form of CORD-19 contingent upon AI applications and open datasets also set the foundation for new initiatives in 2020, including the emergence of information retrieval systems for COVID-19 based on DL, ML, and NLP which could help to compile, parse, and analyze vast quantities of available information through various methods.

The application of NLP and DL was demonstrated in different studies, including one study published in

August 2020 which detected illicit COVID-19 product sales in the efforts to more efficiently enable the reporting of misinformation in social media networks^{xiv}. Both Amazon and Google made recent forays into NLP with the launch of Amazon Comprehend Medical (ACM) and BERT respectively. NLP techniques may be applied to develop text mining tools and resources that assist the medical community in finding verifiable answers to key scientific questions relating to COVID-19^{xv}. ACM, as a machine learning-based NLP pipeline, and BERT, as a DL and NLP model, have powered semantic search mechanisms to perform functions such as phrasal matching, which is a method that improves the matching of user queries to retrievable biomedical articles^{xvi}. BERT is a model that is trained on large raw text datasets to efficiently learn the nuances of natural language. Several works explore the efficacy of BERT models in the biomedical domain for tasks such as information extraction and question answering as it is significant for evaluating the role of AI in information retrieval including the concept of semantic search^{xvii}.

The concept of semantic search as an objective for these tools to search through thousands of biomedical texts in a vast dataset such as CORD-19 had prompted several opportunities for AI applications according to related

findings. A semantic search, according to Bonial et al, can be defined as a form of information retrieval in which the underlying, intrinsic meaning of a query is interpreted by a system which directs to where this information can be most accurately detected in research papers. The search then matches the query to a collection of biomedical research papers that have also been semantically parsed^{xviii}. NLP researchers at the US Army Research Lab developed the tool, InfoForager, as a prototype that could leverage NLP for a semantic search to parse natural language search queries into more meaningful relations within the scientific literature^{xix}. Wise et al, as a group of researchers for Amazon Web Services AI, leveraged SciBERT, a tool with effective performance on NLP tasks which might possibly capture semantic information across CORD-19 articles to enhance information retrieval^{xx}. One publication discussed the application of the SBERT model for a semantic search engine called Co-Search that could possibly handle complex queries (including natural language) to retrieve scientific articles. SBERT operates as a semantic model and variant of the BERT model which is important for the function of embedding queries and documents into the same latent space^{xxi}. Esteva et al, showcase how this model embeds paragraphs to discern if a citation is contained within a given

paragraph and classifying according to this binary method^{xxii}. As Wise et al concluded in their paper, they employed machine learning entity detection models to facilitate the extraction of timely information for scientific queries to benefit the information needs of policy makers and researchers alike^{xxiii}.

IV) Discussion

In the context of infodemic management, a discussion of the findings in this research merited the consideration of the intent to which researchers committed to these initiatives with an increasing emphasis on AI innovations and the incorporation of semantic models and methodologies. In the words of the researchers who developed Co-Search, the tool was designed to:

"support the fight against COVID-19" tens of thousands of documents are being published, only some of which are scientific, rigorous and peer-reviewed. This may lead to the inclusion of misinformation and the potential rapid spread of scientifically disprovable or otherwise false research and data. People on the front lines – medical practitioners, policy makers, etc. - are time-constrained in their ability to parse this corpus, which could impede their ability to approach the returned search results with the appropriate levels of skepticism

and inquiry available in less exigent circumstances"^{xxiv}.

Other findings corroborated the intent of researchers to manage the vast quantities of information which have disseminated not only in CORD-19, but also through other search engines and even in social media networks. As Adly et al note in their scoping review of AI approaches, it is ML and other AI applications which must address the inefficient integration of information from various sources including AI-supported datasets for biomedical literature which hinder the ability of health workers to make informed decisions^{xxv}. New systems, methods, and models can function as a compact form of knowledge sharing that can be designed to be widely deployable and adaptable^{xxvi}.

According to Pham et al, it is both a challenge and an opportunity for regulatory authorities to occupy a crucial role in defining policies which can harmonize the approaches by scientists, researchers and public, or commercial firms to overcome the barriers to crisis management through effective applications of AI^{xxvii}. The development of the CORD-19 dataset is one clear example of the extent of cooperation between these different entities which the findings of this research alludes to.

Although, it is assumed, according to various findings, that the

accuracy of these aforementioned systems with the objectives to semantically mimic search behaviour would increase with the increasing availability of data and AI applications, processing real-time data so these expert systems may become more intelligent, these systems may continue to face difficulties in acquiring, synthesizing, and mobilizing knowledge about COVID-19^{xxviii}.

Regarding semantic search engines such as ACM and BERT, TREC-COVID, a task structure for evaluating the capabilities of information retrieval systems for adhering to the information needs of biomedical researchers, revealed several limitations in a follow up study including the underperformance of a system employing machine learning without specifically labelled data^{xxix}. As Naude et al note in their concluding statements on the potential of AI applications for COVID-19, high quality data is central to the efficacy of AI systems which still operate in a preliminary stage. Furthermore, it is crucial that the data which is gathered, stored and analyzed be handled properly and according to appropriate mechanisms for the governance of AI^{xxx}.

As Bullock et al state in their review, there are promising domains in which AI applications can be deployed to manage the COVID-19 crisis. Funding opportunities which encourage

collaboration and successful partnerships in addition to developments in open science can perform an active role in allowing AI-based systems, methods, and models to facilitate knowledge dissemination and sharing. The authors conclude that despite the difficulties in providing optimal value through AI in the current situation, there are promising domains of collaboration with the AI community for the future^{xxxi}. According to Luccioni et al, future models for AI based solutions for the COVID-19 infodemic must account for a multilingual approach to information, the validation of AI methodologies, data availability and quality and public transparency and scrutiny^{xxxii}.

V) Conclusion

In respect to the intent of this review and the discussion of the findings which addressed the initial questions guiding this research, some conclusions may be drawn which reflect the broader context of AI within the field of information management and retrieval. First, the infodemic crisis as addressed by the WHO and its partners, is an emergent issue which underlies the COVID-19 pandemic and is pertinent to the concerns for information needs and behaviour during a time of crisis. Secondly, the future prospects of this research must persist in the focus on models and methodologies which address this challenge for healthcare workers, researchers

and policy makers so they may make improved decisions for future pandemics and “infodemics” with the support of AI applications. Although the topics of this review remain relevant to crisis management in 2021, one limitation is that the research is restricted to the literature published between January 2020 and December 2020. Current and future research into the applications of AI including NLP, DL, and ML will continue to mark promising contributions and innovations for the long-term benefit of information retrieval and crisis management in the coming years and decades after the end of the COVID-19 crisis.

VI) Endnotes

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