



Information

Maintenance

as a

Practice

of

Care

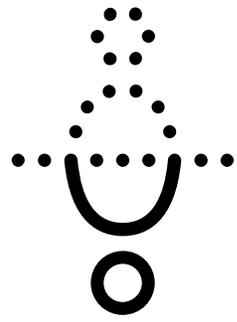
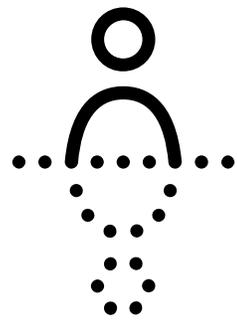
an Invitation

to

Reflect

and

Share



Information Maintenance as a Practice of Care

an Invitation to Reflect and Share

Co-authors (in alphabetical order):

Amelia Acker
Hillel Arnold
Juliana Castro
Scarlet Galvan
Patricia Hswe
Jessica Meyerson
Bethany Nowviskie
Monique Lassere
Devon Olson
Mark A. Parsons
Andrew Russell
Lee Vinsel
Dawn J. Wright

Contributors (in alphabetical order):

Amelia Abreu	Shannon Mattern
Camille Acey	Matt Mayernik
Kendra Albert	Nancy McGovern
Bruce Caron	Ana Ndumu
Marika Cifor	Jessica C. Neal
Ingrid Dillo	Trevor Owens
Emily Drabinski	Sandy Rodriguez
Patricia Falcao	Stephanie Russo Carroll
Nicole K. Ferraiolo	Yasmeen Shorish
Stan Gunn	Eira Tansey
Don Goodman-Wilson	Ruth Tillman
Maui Hudson	Amy Wickner
Cudjoe Jones	Chela Weber
Pearl Ko	Stacie Williams
Andrew Lau	Lynn Yarmey

Contents

Information Maintenance as a Practice of Care	03
1. Welcome to the potluck	07
Who are we?	08
Who is called to the table?	09
Information maintenance practitioners	10
Teachers and Learners	10
Organizational Leaders	11
2. Defining our terms	11
Maintenance	11
Information	13
Care	14



3. Information Maintenance in Caring Practice	16
Who and what do we care for and about?	16
The hyperlocal and the home	17
Other maintainers as individuals	17
Our Communities	18
Knowledge Organization Systems	20
How do we demonstrate care?	22
In communities and organizations	23
Interpersonally	24
For ourselves	25
References	27

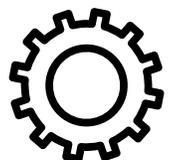


The Information Maintainers. Olson, D., Meyerson, J., Parsons, M., Castro, J., Lassere, M., Wright, D., ... Acker, A. (2019) *Information Maintenance as a Practice of Care*. <https://doi.org/10.5281/zenodo.3236409>

All the content in this paper is under a Creative Commons Attribution 4.0 International (CC BY 4.0) License.

This paper is sent in open source fonts Sporting Grotesque and EB Garamond, and uses icons from the Noun Project by Smallike, Maxim Kulikov and Oksana Latysheva. It was designed by Juliana Castro.

This project is supported by a grant from the Alfred P. Sloan Foundation to the SUNY Polytechnic Institute and managed by The Maintainers and Educopia Institute.





1.

Welcome to the potluck

If information is to be useful over time, something more than preservation is required: it must be carefully maintained. The authors of this paper, all participants in what we call “information maintenance,” came together because of a deep commitment to recasting our work in these terms and infusing it with practices, relationships, and ways of thinking and being that represent a coherent ethic of care.

In this introductory document, we seek to identify both who information maintainers are and who else would be particularly welcome in embracing and supporting information maintenance. We define our key terms of maintenance and care and discuss how they might be practiced, sometimes offering examples to illustrate our points. During the drafting of this paper, we have continually expanded participation in our group of authors and contributors. Nevertheless, we recognize that the perspectives represented here are limited, and we actively seek to broaden them to include additional ways of knowing. If we are to understand information maintenance and practice ethics of care, it is essential that we grapple with problems of power and inclusion. We provide no ready solutions in this paper, but do attempt to highlight related power dynamics, along with areas in need of further study or action.

This paper is not a manifesto. And if it is a provocation, it’s meant to be a gentle one. We storm no barricades, though there are elements of community and resistance in what we as authors aim to do. A key analogy for this document is a potluck dinner: a community event where everyone cooks something to share; where bounty and sustenance are found in the combined gifts of all; and where benefits emerge from the activity of assembly, rather than from any pre-planned agenda or menu of foreseen options. Each of us who has contributed is bringing favorite dishes to the table, with the aim of offering what we ourselves enjoy and find sustaining, and welcoming further contributions and unexpected combinations. We hope that you will accept our invitation to find fellowship—and perhaps even some nourishment—in the potluck discussion that follows.

Who are we?

As information maintainers, we sustain bodies of information, information systems, and the communities that support them. The authors of this document are community organizers and facilitators, archivists, repository managers, project managers, designers, librarians, higher education faculty and administrators, researchers, grant makers, and leaders of nonprofit organizations, industry, and consortia. We are also individuals who wear different hats at different times, and who therefore have widely varied experiences with and in information maintenance. We see this mottled variety as a strength, integral to nurturing generosity and imagination in the framing of maintenance. However, we are aware that our authoring team lacks the perspectives of many other vital groups—such as students, legal and policy advocates, storytellers, technical writers, journalists, genealogists, software engineers, entrepreneurs, open source maintainers, semantic architects, conservators, records managers, and systems administrators. Most of all, we are highly conscious that our initial discussions were shaped by a small, privileged, and predominantly white, middle-class, US-based group—whose demographic limitations closely track that of the longstanding tradition of “collections care” in American cultural heritage organizations.

While we have tried to articulate intersections of information maintenance and care ethics in ways that are real and meaningful for us as authors, we acknowledge that our visions and voices may not resonate with everyone. Throughout the paper, sidebar exemplars illustrate abstract concepts with concrete action, drawing on perspectives beyond our initial discussion group. We also try, throughout the paper, to acknowledge our own social and political context as individuals, and how our identities can both enrich and artificially limit the conversations we would like to open up.

Information infrastructure, like all infrastructure, only becomes visible upon breakdown—as in frozen pipes or rifts between institutions. This reality often means that the people maintaining those infrastructures are also invisible. This invisibility is, at times, circular: stemming from established power dynamics and in-built biases and assumptions that lead to poorly constructed infrastructures that further oppress and

marginalize, either directly or indirectly through their function. In other words, information infrastructures can easily reinforce pernicious structures of racism, classism, and patriarchy. Indeed, systems maintainers are often among those marginalized and undervalued in broken systems. And even when well-functioning and well-maintained information infrastructure fades into the background, the people who enable the flow and preservation of knowledge necessary to a just, humane society can be forgotten or trivialized. By fostering a broader conversation, we seek to honor information maintainers and care-givers and those who depend on their work.

Who is called to the table?

This paper highlights the issues that animate us and identifies different occupations and roles for which we feel that an understanding of the relationship between information maintenance and an ethic of care is especially valuable. It is the first of a handful of documents that our group would like to produce. Our aspiration is for these ideas to be taken up in work with students, in the design of professional development curricula, in management approaches within information and cultural heritage organizations, and in the individual practices of anyone who finds meaning in the concepts we describe.

If you see yourself, your work, and your concerns in the text that follows, please know that we hope to learn from the ways in which your experiences complement or differ from ours. If you find that important perspectives are absent here, please know that we humbly seek to learn what we've obscured, occluded, misrepresented, or missed. We invite you to visit our forthcoming section of The Maintainers website, at themaintainers.org—where you will soon find additional resources, a growing community, and ways to comment and contribute. In short, you may encounter good stuff in this document, but we know it's not a balanced meal. For that, we warmly invite you to the potluck. And please bring a friend!

While everyone is called to the table, in our internal discussions and exchanges with others, we have identified three groups of people who may find concepts of information maintenance and care particularly relevant

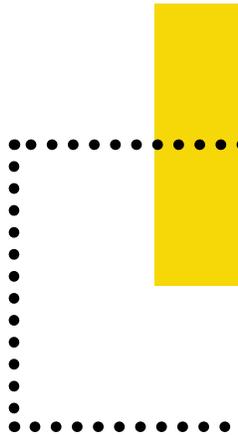
to their work. By emphasizing them here, we also hope to suggest ways that the specific types of labor performed by many information maintainers might align, through these groups, with allied professions and sectors. We believe that this will help us as a community of practice better value our own work—perhaps addressing problems with the invisibility of labor in information maintenance professions, and promoting common cause among information care-workers of various sorts. The three groups include:

Information maintenance practitioners

The practitioner community we address includes all those who maintain the structures, systems, and platforms through which information is transmitted, preserved, or sustained. Among others, they include librarians, archivists, data managers, preservationists, story-tellers, and record-keepers of all sorts, including those who support or protect Indigenous and community-based knowledge. They also include technologists: individual developers and teams of people who support information maintenance through software and systems development in open-source communities or commercial and nonprofit vendor contexts—not least those who work on documentation and standards. All of these groups are (or should be) in conversation with users of the information they seek to maintain.

Teachers and Learners

The future is continually constructed by students and educators, and we hope that our framing of information maintenance through an ethics of care will assist them in transforming societies into spaces where maintenance is valued, normalized, and supported by robust and humane institutions and infrastructure. We include in this group learners and teachers in all disciplines; those working in vocational as well as theoretical fields; people instructing and learning at all educational levels in diverse institutions; and participants across a wide range of professional and community organizations. We also include people who teach and learn outside of formal institutions, as well as community educators in activist and civic groups.



Organizational Leaders

Finally, we hope that high-level administrators and managers who govern, fund, and sustain communities integral to information maintenance work will find our framing of this topic compelling. These communities include policy makers and resource allocators in educational and cultural heritage organizations, funding agencies, businesses, and advocacy groups. We think that the ideas we put forth are relevant to all community and organizational facilitators who structure labor and inspire staff and volunteers in settings ranging from formal organizations to ad-hoc groups, as well as to the direct managers of practitioners—those whose primary job should be to care for, advocate for, and maintain the people who do the work of information maintenance.

2.

Defining our terms

Our project centers on capacious words: maintenance, information, and care. Their breadth and depth can be suggestive and generative, but such words can also be vague and run away from us. We need to define our terms, but our aim is to do so in accordance with our potluck theme. That is, we want to invite further contributions, rather than shut down possibilities through a predefined menu of options.

Maintenance

Acts of maintenance sustain and repair people and things, and include the many actions, large and small, that keep our sociotechnical world going (Russell and Vinsel, 2016), as well as the interfaces we design to function between and among information systems. Maintenance is not the opposite of change, however, and its primary aim and value is not to uphold stasis. We view acts of repurposing and revision or reuse as part of maintenance (Jackson, 2014), and observe that, traditionally, organizations overseeing complex technologies have used moments of maintenance and repair not just to sustain, but to upgrade and re-imagine their systems. Similarly, moments of upgrade and re-imagining can also resource and provide justification for maintenance processes.

Where maintenance-minded approaches do promote continuity, they should not be uncritically conservative of systems of historical or contemporary oppression; nor do we wish to valorize the maintenance of systems that exacerbate other harms, such as those resulting from or contributing to anthropogenically-driven climate change, surveillance and exploitation of people through monetized data capture, or discrimination based on race, class, gender, or other perceived differences. Generally, however, we argue that the value and vitality of practices of maintenance are not adequately recognized in cultures of the new, which prize, reward, and orient themselves toward “disruptive” innovation. The devaluation of maintenance in such contexts holds true across fields and can encompass a lack of recognition of traditional or Indigenous knowledge-keeping as well as of the everyday ingenuity of people’s adaptations to altered circumstances and infrastructure.

The graphical and interactive expression of an information maintenance system shapes the way it is approached, understood, and perceived. One challenge to addressing maintenance is that it is often difficult to see. The information infrastructure that acts of maintenance support is frequently invisible until it breaks (Bowker and Star, 2000), thus making effective care work hard to study and appreciate. To do so, one must deliberately focus on interfaces, interactions, and information flows. Yet a further challenge arises through the seduction of the new—especially conspicuous in the start-up environments of high-tech companies, but with an increasingly insidious presence in cultural heritage organizations and institutions of higher education. In a largely throwaway culture that rewards and encourages novelty, how can maintenance be framed as a pressing concern? How can those who perform maintenance be brought forward and how can those who benefit from maintenance share the burden of upkeep?

These are topics that we, as information professionals, have a particular awareness of and insight into. We feel the epistemological and social consequences of the



RepoData project

The [Repository Data project](#) is working to create a comprehensive index of the physical locations of archives, particularly those at risk due to the consequences of climate change. In an [RBMS presentation](#), Eira Tansey, Ben Goldman, and Whitney Ray talk about the mundane work needed to gather and clean this data, all to facilitate maintenance on a larger/different scale.

failure to teach and value maintenance, just as we see practical and social consequences of deferred information maintenance. Failure to address failing systems results in damage to our imaginations—to our capacity for hope and new ideas—as well as to our daily lives and those of the people and things we care about. The consequences of inattention to maintenance are both immediate and generational (Mattern, 2018) and often unevenly distributed along lines of privilege and disenfranchisement.

Information

What is information? The answer depends on the context in which the question is asked. Since the 1970s, library and information science (LIS), communications, and psychology researchers have developed more than 25 leading definitions and articulated 29 related concepts in attempts to answer this question (Case, 2012). Most LIS scholars recognize four fundamental types of information (Buckland, 1991). Information can come from processes, as we experience in the act of becoming informed or learning something new. Information can take the form of knowledge about facts, events, or people which can be represented in some physical, structured, and formatted way—such as a newspaper article or an email

message. Information can also be found in objects and performances: dance, fossils, quilts, seeds, woven baskets, utterances. Finally, information can originate from processing and handling, transformational acts through which we derive new versions of information: for example, metadata structures that give meaning to frequencies across databases.

Power inheres in the acts of identifying, classifying, and ordering information. People who are privileged to define information of importance and dictate how it is organized and shared have disproportionate influence on the shape and dynamics of society. This is evident in everything from the construction of national identities through census, maps, and museums (Anderson, 2006) to how decisions are made on employment, education, healthcare, suffrage, policing, imprisonment, and more (Bowker & Star 2000, Alexander, 2010, O’Neil, 2016).

Write the Docs

Write the Docs is a community of writers who come together around a set of regular conferences and meetups: “We consider everyone who cares about communication, documentation, and their users to be a member of our community. This can be programmers, tech writers, developer advocates, customer support, marketers, and anyone else who wants people to have great experiences with software.” Documentation here includes user guides, FAQs, installation instructions, contribution standards, support contacts, issue tracking, and other ways to interact with open-source software.

Today, the emergent surveillance economy of Facebook, Google, Amazon, and similar companies highlights the damage misguided and poorly controlled information systems can create (Noble, 2018).

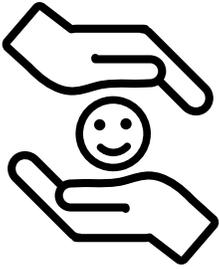
Because maintenance and care practices are particularly concerned with power and with issues of social equity that arise through the transmission, reception, and reach of information, our shared definition of information relies strongly on processes that support sense-making (Dervin, 1998). Sense-making happens in the act of representing information to solve a problem, make a decision, convey a feeling, or accomplish a task. Sense-making with information reflects the procedures, skills, and behaviors that allow people to move between more objective or external sources information and the more subjective, internalized or embodied information that represents personal points of view. These combine to help us understand the world and act on that understanding. For those of us concerned with the maintenance and care work that information infrastructures require, issues like sense-making and the derivation of information from processes, processing, and knowledge creation are particularly important. This is because each of these can be found in the collections we steward, the bodies we inhabit, and the systems of access and retrieval that we aim to support over time.

Care

Challenging the available moral theories of Kantianism and utilitarianism—which overemphasized a narrow conception of “reason” and failed to recognize the essential and often gendered work of caregiving in moral life—scholars like Gilligan (1982), Held (2006), and Tronto (1993) have turned our attention to a feminist ethic of care (Nowvieskie, 2016). The context for our paper and its hoped-for intervention is somewhat similar: we want to highlight the constant and sustaining presence of maintenance and care—for people and for things—in the information

Coding to care and coding carefully

The first Distributed Web of Care workshop took place in March 2018 during Rhizome’s Ethics & Archiving the Web conference at the New Museum. Led by artist Taeyoon Choi, the DWC is a research initiative exploring communication infrastructure and offering resources to understand and join a peer-to-peer alternative web that prioritizes individual ownership of data, collective agency, and care. Choi, who is actively engaged with issues of ethics of technology and accessibility, points at the harmful technology-to-cure narrative and invites to shift to a care-focused one: “Care, in contrast to cure, is a form of stewardship between people who support each other in communication, action, and social engagement. It is actualized by extending one’s mindfulness of another person’s dignity and feelings, while respecting their independence.” and he continues “Caring differs from an explicit division of power and is not a transfer of the decision-making process, because it is based on a sense of interdependence, which is a free exchange that cannot be contracted or automated.” (Choi, 2018)



practices we most value, even within a contemporary culture that is often more attentive to novelty as an end in itself.

Like information, care is best understood not in terms of a fixed definition, but as an ongoing set of negotiated, contextual, and interrelated responsibilities, practices, principles, and values. “The central focus of the ethics of care,” writes feminist philosopher Virginia Held (2006), “is on the compelling moral salience of attending to and meeting the needs of the particular others for whom we take responsibility.” Care is therefore connected, capable, and mutually reinforcing, a notion which tracks closely with Joan Tronto’s four ethical elements of care: care is attentive, responsible, responsive, and iterative. If our group seeks to expand these definitions at all, it is to point out that individuals and groups take care of both people and things—including expressions and infrastructures of information—and that care for humans and for objects and systems are often connected.

Our conversations have delineated care, as connected to information maintenance, through the following characteristics. Care is:

→ *Active.* Care is a verb as well as a noun. Care is enacted, and its practices result in cultures of empathy (Caswell and Cifor, 2016) and of stewardship—a word of choice in museum, special collections, and data communities.

→ *Collective.* Care requires interconnection, at minimum between the caregiver and an object of care, but is more generally practiced in networks and in community. In our context, for instance, we might look to local collective data management infrastructure planning and development (Baker & Karasti, 2018) as an example of enacted, networked care.

→ *Organized.* Its activities and systemic effects are distributed and sustained through social organizations, institutions, and practices, many of which are intended to be resilient.

→ *Scalable.* Care works at both small and large scales, for and among different communities and regions, from the interpersonal to the international. It can be embedded in the operations of local, state, and national governments, foundations, and NGOs, and in organizations designed for mutual aid, as well as in organizations dedicated to cultural heritage and contemporary communication missions, such as libraries and archives.

→ *Interdisciplinary*. Care works across sectors and disciplines. Looking beyond our own disciplines can help us to theorize and understand our work more deeply. We are particularly challenged by the problem that too few information maintainers are trained to think and communicate across multiple audiences.

→ *Intergenerational and sustained*. Acts of care preserve the knowledge of one generation so that it can be engaged with, interrogated, and built upon by the next. Likewise acts of care help us to extend and prepare that knowledge for present application and for future uses and users yet unclear.

Finally, we enact all of these facets of care in the context of power relations. Who is allowed to care and in what spaces? Who orders, elevates, and acknowledges or rewards the labor? It is crucial to acknowledge that care takes place within cultural systems of whiteness and capitalism that function as drivers of funding, access, and support.

3.

Information Maintenance in Caring Practice

Who and what do we care for and about?

Feminist philosophers like Silvia Federici, Serene Khader, Loretta Ross, and Victoria Law have noted the intersection of practice and emotion in care, suggesting that we typically care best for the things we care most about. An early thought exercise employing Nel Noddings' "chains of caring" (1984)—a framework that conceives of concentric circles of care, starting with those closest to us and extending outward—proved useful to us as authors, in helping to catalog the range of things that motivate our own care-work as information maintainers. As the circles we defined in this preliminary exercise moved outward, they changed contextually, becoming both more diffuse and more encompassing—to include environments and ecosystems, functioning from familial to global levels. We've distilled them here.

THE HYPERLOCAL AND THE HOME

We know that chains of caring start in the home—with our biological and/or chosen families—and orient themselves around the quotidian objects and fellow living creatures with whom we share our lives: loved ones of all ages;



Seed Saving Networks: Food, Data and Community

The work of saving seeds is maintenance carried out on a patently intergenerational scale. Seed saving networks exist both locally and as global efforts, preserving germs of potential for the next harvest as well as for harvests ten generations from now. The “Global Seed Vault” (tucked in a vault in the side of a mountain on the Arctic island of Svalbard, Norway) is an international effort to safeguard biodiversity against planetary apocalypse. However, seed saving is also part of everyday practice in many communities. Smaller seed-saver networks emerge informally between neighbors and sometimes grow to involve gardeners across regions.

pets, plants, and gardens; wildernesses and parks; the material culture of our everyday lives; and the rooms and spaces in which we sleep, laugh, and play. These are the beings for which and places in which we have learned to care. At the same time, these hyperlocal spheres can reveal our own anthropocentric perspective, as well as a tendency to value people, places, and things most in terms of their relevance or usefulness to our own ends. It is necessary to translate hyperlocal caring to broader communities and scales, not because they are beneficial to us, but because of the intrinsic value of spheres beyond our own immediate home.

OTHER MAINTAINERS AS INDIVIDUALS

As information maintainers, we find that we care intensely about and for our colleagues, other maintainers—people we’ve worked with as peers, staff, supervisors, teachers, and students—who we recognize as working in information contexts that can be hostile and are rapidly changing, and within systems that are sometimes devolving or being only maintained through strenuous efforts. These are people working with, as Adrienne Rich’s (1978) poem has it, “no extraordinary power,” and yet we marvel as they continually “reconstitute the world.” We acknowledge, too, that our relationships with other information maintainers often cross professional and personal boundaries, bringing with them a number of emotional complexities and power dynamics.

We care for our fellow maintainers by connecting with them as caring people, and by trying to foster their personal and professional growth. Maintenance work is generally underpaid, devalued, and resistant to easy measures of success and progress. We attempt to demonstrate our care by advocating for the recognition and fair compensation of the labor of information maintainers and the value their work can produce for society and the natural world.

DLF Group on Labor in Digital LAM

The DLF Working Group on Labor in Digital Libraries, Archives, and Museums was formed in early 2017 in order to develop a more in-depth understanding of labor in digital libraries, and to produce a variety of agendas, guidelines and frameworks to better support ethical practices in this area. To date, the group has developed a research agenda for Valuing Labor in Digital Libraries, a library of readings on contingency and precarity, and a set of draft guidelines for Developing and Supporting Grant-Funded Positions. In 2019, they host a series of National Forum meetings on the library and philanthropic communities' "collective responsibility" for developing ethical labor standards for workers and institutions dependent on grant funding. By valuing and elevating the experiences of information maintainers and managers from a variety of organizations, this working group seeks to draw together a number of previously disconnected conversations around the topic of labor, foregrounding an ethic of care for collections and the people who tend them.

OUR COMMUNITIES

Information maintenance practitioners invariably function within a variety of community spaces. We and the colleagues we care about participate in them for varied reasons, including personal values and the sense of satisfaction we get from contributing to efforts in which we can make a collective difference. We acknowledge that we participate too, at times, because we can't figure out how to extricate ourselves in a caring way.

Information maintenance communities may include:

→ Groups of elders or the keepers of sacred or closely-held systems of knowledge, sometimes functioning outside the technological frameworks that are commonly addressed by Western information scholars and practitioners—or making novel, alternative, and even subversive uses of those same frameworks.

→ Learning cohorts and communities, involving our students and educator colleagues, our mentors and mentees, and ourselves as lifelong learners.

→ Cultural communities who maintain languages, practices, holidays, and norms by practicing them in their daily lives, sometimes against, sometimes within, and sometimes alongside the cultural practices of entirely different communities.

→ Discipline-specific research communities that share a repertoire of methods and discursive conventions.

An Afrofuturist Community Archive

Rasheedah Phillips and Camae Ayewa opened their "Community Futures Lab" in an unassuming Ridge Street storefront, just as the North Philadelphia neighborhood in which they live and work began to reel from a massive, municipal redevelopment project—in which the city exercised eminent domain to demolish apartment buildings and displace hundreds of low-income families. Phillips, a housing lawyer and Afrofuturist writer, and Ayewa, who performs experimental and "slaveship punk" music as the artist Moor Mother, lead the lab's grassroots effort to capture community stories and memories—local history—ahead of what might seem like an inevitable diaspora. But inevitability itself is questioned by the key principles of Afrofuturism

→ Government workers and contractors supporting complex systems, as varied as satellite information systems, the federal census, outposts for environmental monitoring, and systems supporting health care and social security.

→ Issue-specific communities that focus on ways to address a specific information maintenance problem or challenge, such as digital preservation, open source software, or post-custodial stewardship and digital repatriation.

→ Information standards organizations which create and maintain standards that both support and are entangled in the work of information maintenance.

→ Professional and membership organizations, particularly those serving information or cultural heritage practitioners or institutions, whose missions sometimes (and should more frequently) describe information maintenance through a lens of care with emphasis on social responsibility, service, education, and diversity and inclusion.

→ Workers' collectives and labor unions representing information maintainers and collectively protecting and caring for the working conditions of themselves and others—in order that those represented can, in turn, maintain knowledge systems and structures that mediate and support information access.



and Black Quantum Futurism that drive this partnership. Part gallery space, workshop, and library, the Community Futures Lab hosts programming and provides imaginative resources that prompt local residents to pair hope with history and fight not only against gentrification, but against what Phillips calls “the master clock:” Western notions of “progress” and linear time that have contributed to Black people’s oppression. It is also a site for care. A hand-lettered sign in the window reads, “Feeling unsafe? Need a community space? Come in!” Here is an information community in the making: gathering and organizing cultural memory and creating caring, generative information practices in the face of challenges that are both immediate—and cyclical.

Some of these communities may not be highly visible. Often, as information maintainers, we find ourselves functioning in hidden communities—while at other times we may contribute to the problem of neglect. Caregivers provide indispensable labor, and also make it possible for others to work and focus their attentions elsewhere. This contributes to their status as a hidden community, rarely compensated in kind with the value of their work, perhaps in part because such recognition would require the admission that we ourselves do not always provide care for our loved ones. Still other communities may intentionally obscure themselves in order to protect the knowledge or cultures they uniquely steward from larger, hostile forces. Silence and refusal are two modes that Indigenous

communities may adopt in order to refute narratives of acceptance or a “settled past,” which are an attempt by historically powerful communities to erase knowledge of colonization and deny space to others (Simpson, 2017). Other forms of erasure are more direct, and can be revealed in archives where a lack of historical materials on marginalized communities exists or is made available, despite the peoples’ ongoing presence, or where appropriations and misinterpretations of indigenous records are allowed to persist.

We care for our communities by working to facilitate the cohesion and sustained engagement of their members. We believe the communities and cohorts that are meaningful to us in the context of information maintenance will be most successful if they combine the perspectives, experiences, and resources of their members in a thoughtful and caring way; understanding that care work requires concentration, resources, and independent community agency.

KNOWLEDGE ORGANIZATION SYSTEMS

Information maintainers repair, care for, document, and update a wide variety of knowledge organization systems. These may be software systems—catalogs or other discovery systems, identity management systems, repositories, digital humanities and arts projects, or knowledge management systems such as intranets and documentation—which require troubleshooting, patching, and updating (Tillman, 2018). Or they may be more abstract that are more abstract, but no less critical, such as: records management and retention schedules; technical standards; emergency response networks; mission and vision statements; policy documents and strategic plans; or organizational charts.

Libraries and other information-centered institutions exist and persist through coupling technologies with standards, human intermediaries, routines, and community norms to maintain knowledge organization systems (Mayernik, 2016). Systems are social constructs, inheriting the

C.A.R.E Principles

An Indigenous Data Sovereignty interest group within the Research Data Alliance has developed principles for Indigenous data governance. This group of academics and practitioners recognise the tension that Indigenous communities feel between protecting their rights and interests in traditional knowledge and Indigenous data while supporting, or being subject to, open data initiatives. Concerns about the secondary use of data, and limited opportunities for benefit-sharing, have focused attention on enhancing Indigenous participation in data governance. The emerging C.A.R.E Principles for Indigenous Data Governance (Collective Benefit, Authority to Control, Responsibility, and Ethics) bring a people centric perspective to the use of data to complement the data centric FAIR principles (Findable, Accessible, Interoperable, Reusable). The goal is that maintainers and other users of Indigenous data will be both FAIR and C.A.R.E.

biases and frameworks of their creators and sustainers (Noble, 2018). Our systems are reflections of the people and organizations with the privilege to build them (Dohe, 2019).

Considering organizations in this way leads to new questions about the kinds of collective intelligence and routine labor required to not only keep such systems in operation, but also make them more sustainable, maintainable, and coherent. Following Nel Noddings, we ask: how can information maintainers shape our organizations to provide “conditions that make it possible for caring relations to flourish?” We hope to highlight the distance that often exists between organizational mission, vision, and the culture and practices fostered by leadership.

Information maintainers maintain knowledge organization systems because they provide value to us and to their users, and because they invariably instantiate specific frames around the information contained within and accessed through them. Such systems are embedded in power structures and also contain and channel power, because they articulate different ways of knowing. As maintainers, we want to understand, expose, and interrogate those power structures, both for ourselves and in community with others. We want to establish a path toward digital resilience of data and digital tools—including, for instance, geospatial tools (e.g., Koch, 2017) which can help communities move toward

equity and inclusion. Information infrastructures need the capacity to deal effectively with changes or threats, to recover quickly from challenges and difficulties, and to withstand stress and catastrophe (Wright 2016). At the same time, we must recognize that resilience is a structural endeavor and not the responsibility of only those who are threatened or marginalized (Berg, Galvan, and Tewell, 2018). Likewise, the rhetoric of resilience in information systems can exacerbate problems and inequities. See, for example, the postcolonial ecocriticism of Susie O’Brien, which “advances an ‘agenda of empathy,’ but complicates Jackson’s lauding of resilience manifested in acts of repair... show[ing] how comfortably the concept of resilience—of bouncing back, of being flexible and



Data 4 Black Lives

Data 4 Black Lives is “group of activists, organizers, and mathematicians committed to the mission of using data science to create concrete and measurable change in the lives of Black people.” Their work reclaims data tools often used for redlining, surveillance, and discrimination against Black communities, and redeploys them to empower movements and fight bias. Data 4 Black Lives fights for algorithmic accountability, offers critical examinations of the use and reuse of data for justice, and serves as a powerful interdisciplinary connector for civic action and professional growth in the communities it serves.

adaptable as a measure not just of ecological fitness, but of a kind of ‘moral worthiness’—has aligned with ‘the ideals of neoliberalism:’ constant volatility, strategic dynamism, deregulation, and the consequent ‘dismantling of environmental and social welfare programs’” (Nowviskie, 2015).

Maintaining knowledge systems also helps to support the people who work within them and, in the case of interdependent or interlocking systems, the work that is done to ensure interoperability. This is a positive process when enacted with an ethic of care; however, when maintenance work is enacted without critical interrogation of the power structures within which its objects are embedded, that work can lead to the maintenance of harmful systems such as patriarchy or white supremacy. In such cases, careful information maintenance entails working against rather than maintaining malign structuring systems. Organizational leaders bear particular responsibility to identify such systems and support their dismantling.

We honor practices of information maintenance in interlocking chains of caring that are always dynamic and ever-changing. The purpose of the practices we advocate is not to fix the meaning of information in time—even if fixity of raw data and preservation of records of the past is a crucial goal of some information work—but rather to foster and sustain generative, speculative, and interdependent systems and environments. In our view, the work of information maintenance is future-oriented, with the goal of making the systems in and on which it is performed open themselves up to community-driven brands of creativity, adaptation, and transformation that are respectful and deeply rooted in care.

How do we demonstrate care?

Enacting information maintenance requires highly variable work and its shape depends on

Software Preservation Network and Community Cultivation

The Software Preservation Network (SPN) is an information maintenance community dedicated to ensuring the long term access, sharing and reuse of software (Software Preservation Network, n.d.). SPN’s benchmarks and accomplishments represent the collective effort of a dedicated, volunteer network of individuals from a range of organizations. Since 2017, the Network has strived to strike a balance between a) laying a solid foundation for broadening participation in software preservation and b) demonstrating the need for institutional investment so that SPN’s efforts can be supported, sustained and expanded. In partnership with Educopia Institute, SPN is currently eliciting institutional investment to secure part time or full time staff to advance SPN to the next stage of community development (Meyerson, 2018). During this transition period, SPN has employed Community Cultivation - A Field Guide to understand and evaluate our maturation (Skinner, 2018). The Field Guide provides mechanisms for assessing, developing, managing, and sustaining community projects, programs, and organizational operations. It also offers a snapshot of the tools, resources, and training modules Educopia regularly uses in its consulting and community-building work, including templates, workshops, and guides.

the context in which that work takes place. Therefore, consistent with an ethic of care, we want to highlight modes of information maintenance that are not—as is more customary in discussions of practice—defined by specific types of tasks or behaviors, but rather by our relationships to one another. We recognize that some of the actions described below are well modeled by our colleagues in information fields while others are more aspirational, representing areas where maintenance and care could be applied with more intention and commitment. Yet care cannot be seen simply as a measurable duty to be performed. It must be demonstrated: rooted in a strong ethic of humility and empathy (cf. Clegg and Rowland, 2010).

IN COMMUNITIES AND ORGANIZATIONS

Information maintainers give voice to others. We should support those who welcome advocacy, amplify the voices of those who are not heard, and respect the decisions of others to remain silent, or not share their own culture’s knowledge or materials (Christen, 2012). Feminist citation practices (Tanaka, 2015) represent an example of how information maintainers give voice to others within community. Citation

is a well-understood practice that follows community-specific conventions and supports community-specific rewards. Feminist citation practices are explicitly rooted in generosity, raising the visibility of new, unknown or untenured contributors, supporting those who take risks with less organizational support or fewer resources, and amplifying questions in contexts in which they might not otherwise be asked.

Information maintainers give space to others. We should work to distribute ownership for

the vision and direction of our knowledge organization and information systems. Participatory design research, agile software development, and assets-based community development are all information maintenance methods that expand the types of contributions to these systems. Multiple contributors play an important part in building and maintaining information architectures.

Libraries We Here

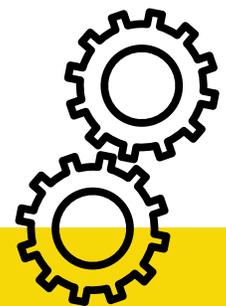
We Here is “a supportive community/space for library and archive workers and library and information science (LIS) students of color. Some of the ways in which We Here can be described is as a support group, collaboration network, and mentorship platform. We Here has closed platforms specifically for People of Color (POC) and open channels for everyone else. We Here is doing the work our institutions and organizations have not yet built into the fabric of our profession. We Here is helping to retain POC in LIS professions.”

Information maintainers give support to others. As educators, we should listen actively, respond with empathy, and raise awareness through discussion and examples. Within institutions we should document, review, verify, and consider systemic and personal impact. Forms need to be submitted, timesheets need to be signed, reports need to be written, schedules need to be proofread, classrooms need to be assigned, and bylaws need to be revised. However, by infusing bureaucratic maintenance work with an ethic of care, we can challenge contemporary workplace attitudes surrounding “productivity” and “efficiency,” moving toward the recognition of maintenance itself as a valued contribution. We can also broaden access to systems of information, thereby supporting its generative value, per Wilbanks (2013) who offers Zittrain’s (2008) definition: generativity is “the capacity to produce unanticipated change through unfiltered contributions from broad and varied audiences.”

INTERPERSONALLY

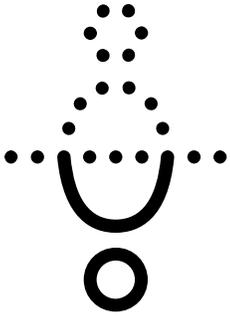
Information maintainers acknowledge and act on power imbalances. Intersecting networks of privilege and power are always in play. Few information maintainers are in positions of great power, but all should use their capacity and position to support and care for those with less power, to facilitate contributive justice models of collaboration (Sangwand, 2018), and to document knowledge for long term access and purposes of liberation.

Information maintainers practice empathy. Care can be measured in terms of its emotional and practical impact: how we sense it makes others feel, and how feelings can change the terms of power and provoke or inhibit interpersonal action. This understanding of care does not diminish the need for material interventions beyond emotional care, but nonetheless we see radical empathy as supporting inversions of power and holding the potential to reorient “charitable” or obligatory maintenance work to frameworks of mutual aid. This can happen through the caregiver’s capacity to appreciate interpersonal



Challenging Diversity in the Academy

Deb Verhoeven’s research uses social network analysis to visualize the networks of Australian Research Council Linkage Infrastructure, Equipment and Facilities (ARC LIEF) and National Health and Medical Research Council (NHMRC) award winners. Her research confirmed men received the majority of grants and overwhelmingly worked in male-only teams. Verhoeven’s findings have implications for how networks of information workers might be analyzed to determine concentrations of power and influence, as ARC LIEF award winners drive the infrastructure of research in Australia.



and systemic impacts and participate respectfully and empathetically—and with care for the self—in the pain and joy of others.

To understand and begin to dismantle power imbalances, we must leverage our own strengths, which lie in the centrality of emotional labor, the role of self worth and self-actualization among all participants in information networks, and the nuanced and nonbinary conceptions of personal identities that can inform and shape our work. We must also enter into dialogue with those outside the sphere of information maintenance, whose own work frequently depends upon our own labor.

FOR OURSELVES

Self-care is a necessity and to acknowledge its importance is simply a recognition that attention to one's personal needs is an activity of all mature and healthy humans. We are concerned that our society, by valuing busy-ness and efficiency and understanding information networks and information workers in those terms, tends to diminish the importance of self-care.

We therefore wish to affirm the following practices for information maintainers:

→ Take time to assess and value your own contributions. Self-knowledge is essential for personal growth, and for effective participation in maintenance teams. Sometimes, the value of your work can be invisible even to yourself (Karasti & Baker, 2004).

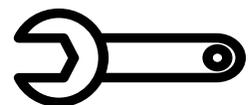
→ Take time to assess and value your own information activities. Knowledge of one's own data traces, information choices, and consciousness of the tools and platforms that we use to mediate our everyday interactions with people and information is an essential aspect of informed citizenship. Understanding the complexities of these activities provides a foundation for positive action in our roles as information maintainers.

→ Claim your space and time, and replenish your energy. Enacting care can be draining, and burnout is a significant risk: “the resource we tend to under-appreciate and that isn't limiting (although it might feel that way) is our energy. Our personal energy – within our bodies, minds, and spirits – is renewable. But, we have to invest in renewing it” (McLeod, 2013). Cycles of renewal are essential for sustaining our abilities to care for others

and for information systems. Particularly for information maintainers from marginalized groups, care for the self “is not self-indulgence, it is self-preservation and that is an act of political warfare” (Lorde, 1988). By acknowledging the time that self-care demands, we demonstrate for those around us that acts of renewal are necessities.

Throughout this paper, we have worked to introduce and frame certain concepts we see as key to understanding information maintenance, to expand the numbers of people who can be understood as contributors, and to articulate that an ethic of care is essential to this work. We’ve also suggested specific ways in which caring practices sustain both people and knowledge networks—connecting us as individual information maintainers with each other and with the systems, communities, and collections with which we work, and opening possibilities for social transformation and intergenerational exchange.

For acts of maintenance—of all kinds—to be valued in an information-rich society, the work of information maintainers must become both an object and a vector of care. If these ideas resonate with you and are helpful in describing or expanding your professional and personal practices, please join us in exploring them.



References:

- Alexander, M. 2010. *The New Jim Crow*. New York: The New Press.
- Anderson, B. 2006. *Imagined Communities*. London: Verso.
- Baker, K. S., and H. Karasti. 2018. "Data care and its politics." *Proceedings of the 15th Participatory Design Conference on Full Papers - PDC '18* <https://doi.org/10.1145/3210586.3210587>.
- Berg, J., Galvan, A., & Tewell, E. 2018. Responding to and reimagining resilience in academic libraries. *Journal of New Librarianship*. <https://www.newlibs.org/article/3218-responding-to-and-reimagining-resilience-in-academic-libraries>
- Bowker, G.C., and S. L. Star. 2000. *Sorting Things Out: Classification and Its Consequences*. Boston, MA: The MIT Press.
- Buckland, M.K. 1991. Information as thing. *Journal of the Association for Information Science* 42(5): 351-360. [https://doi.org/10.1002/\(SICI\)1097-4571\(199106\)42:5<351::AID-ASI5>3.0.CO;2-3](https://doi.org/10.1002/(SICI)1097-4571(199106)42:5<351::AID-ASI5>3.0.CO;2-3)
- Case, D.O. 2012. *Looking for Information: A Survey of Research on Information Seeking, Needs, and Behavior*. 3rd ed. Bingley, UK: Emerald Publishing Group.
- Caswell, M.L. & Cifor, M. 2016. From Human Rights to Feminist Ethics: Radical Empathy in Archives. UCLA. Retrieved from <https://escholarship.org/uc/item/0mb9568h> 2019-03-15.
- Choi, T. 2018. "Artificial Advancements" *The New Inquiry*, February 2018 <https://thenewinquiry.com/artificial-advancements/>
- Christen, K. 2012. "Does Information Really Want to Be Free?: Indigenous Knowledge and the Politics of Open Access," *The International Journal of Communication*, Vol 6: 2870-2893. Retrieved from: <https://ijoc.org/index.php/ijoc/article/view/1618>
- Dervin, B. 1998. "Sense-making theory and practice: an overview of user interests in knowledge seeking and use", *Journal of Knowledge Management*, Vol. 2 Issue: 2, pp.36-46, <https://doi.org/10.1108/13673279810249369>
- Dohe, K. 2019. Care, Code, and Digital Libraries: Embracing Critical Practice in Digital Library Communities. *In the Library with the Lead Pipe*.

Gilligan, C. 1982. *In a Different Voice: Psychological Theory and Women's Development*. Cambridge, Mass.: Harvard University Press.

Held, V. 2006. *The Ethics of Care: Personal, Political, Global*. Oxford University Press, 2006, 211pp, ISBN 0195180992.

Jackson, S. J. 2014. "Rethinking Repair." In *Media Technologies*, edited by Tarleton Gillespie, Pablo J. Boczkowski, and Kirsten A. Foot, 221–40. The MIT Press. <http://mitpress.universitypressscholarship.com/view/10.7551/mitpress/9780262525374.001.0001/upso-9780262525374-chapter-11>.

Karasti, H. and K.S. Baker 2004. <https://doi.org/10.1109/hicss.2004.1265077>

Koch, T. 2017. *Ethics in Everyday Places: Mapping Moral Stress, Distress, and Injury*. MIT Press and Esri Press, 259 pp.

Lorde, A. 1988. *A Burst of Light*. London: Sheba Press.

Mattern, S. 2018. "Maintenance and Care." *Places Journal*, November 2018. <https://placesjournal.org/article/maintenance-and-care/>

Mayernik, M. S. 2016. "Research data and metadata curation as institutional issues." *Journal of the Association for Information Science and Technology* 67 (4): 973-93. <https://doi.org/10.1002/asi.23425>.

McLeod, K. 2013. Re-energizing your work and your life, COMPASS Science Communication, Inc. Blog, <https://www.compasscomm.org/blog/re-energizing-your-work-and-your-life>. Last accessed 14-January-2019.

Noble, S. U. (2018). *Algorithms of oppression: How search engines reinforce racism*. NYU Press.

Noddings, N. *Caring, a Feminine Approach to Ethics & Moral Education*. Berkeley: University of California Press, 1984.

Nowviskie, B. 2016. "Capacity Through Care." In *Debates in the Digital Humanities 2019*, edited by Matthew K. Gold and Lauren F. Klein. University of Minnesota Press, Forthcoming. <http://nowviskie.org/2016/capacity-through-care/>

Nowviskie, B. 2015. "Digital Humanities in the Anthropocene." *Digital Scholarship in the Humanities*, Volume 30. <https://doi.org/10.1093/lc/fqv015>

O'Neil, C. 2016. *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy*. New York: Broadway Books.

Rich, A. 1978. "Natural Resources". *The Dream of a Common Language*. New York: W. W. Norton & Company, 60-67.

Russell, A and V. Lee. "Hail the Maintainers" *Aeon Essays* 2016 <https://aeon.co/essays/innovation-is-overvalued-maintenance-often-matters-more>

Sangwand, T.-K. 2018. Preservation is Political: Enacting Contributive Justice and Decolonizing Transnational Archival Collaborations. *KULA: knowledge creation, dissemination, and preservation studies*, 2(1), p.10. DOI: <http://doi.org/10.5334/kula.36>

Simpson, A. 2017. "The ruse of consent and the anatomy of 'refusal': cases from indigenous North America and Australia" *Postcolonial Studies*, 20(1), 18-33. <https://doi.org/10.1080/13688790.2017.1334283>

Tanaka, M. "Feminist Approaches to Citation". *cmagazine* 126 (Summer 2015). <https://www.cmagazine.com/issues/126/feminist-approaches-to-citation>

Tillman, R. "Beyond Posters: On Hospitality in Libtech." *Code4Lib Journal*. <https://journal.code4lib.org/articles/13432>

Tronto, J.C. *Moral Boundaries: A Political Argument for an Ethic of Care*. New York: Routledge, 1993.

Wilbanks, J. 2013. "Why Open and Machine Readable?" Research Data Alliance 2nd Plenary, Washington DC, 16 Sept. 2013. https://www.rd-alliance.org/sites/default/files/attachment/Wilbanks_RDA.pdf

Wright, D.J., 2016. Toward a digital resilience, *Elementa: Science of the Anthropocene*, doi: 10.12952/journal.elementa.000082.

Zittrain, Jonathan L. 2008. *The Future of the Internet— and How to Stop It*. New Haven, CT: Yale University Press. <http://blogs.law.harvard.edu/futureoftheinternet/download/>

