Building ethical AI literacy in digital library practice

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Abstract: *The integration of artificial intelligence into digital library operations presents a fundamental challenge to the professional values of equity, privacy, intellectual freedom, and transparent stewardship that have long defined librarianship. This article argues that the development of ethical AI literacy is not an optional adjunct to digital library practice but a core professional competence essential for maintaining institutional trust and epistemic integrity in an algorithmic age. The discussion examines three critical domains where AI systems exert significant influence over library functions, namely discovery and retrieval systems that embed historical biases into ranking and recommendation algorithms, automated metadata generation tools that perpetuate and amplify colonial and exclusionary vocabularies, and user data collection practices that threaten the foundational library value of intellectual privacy. The article contends that ethical AI literacy requires digital librarians to move beyond superficial technical awareness toward a critical, sociotechnical understanding that encompasses algorithmic auditing, transparent provenance documentation, vendor negotiation, and privacy impact assessment. Furthermore, it positions the digital librarian as a critical mediator and educator who empowers users to navigate algorithmic environments with informed scepticism. The institutional implications of this framework are substantial, demanding curricular reform in library education, the creation of cross-functional ethics teams, shared professional frameworks for algorithmic impact assessment, and a culture of collective accountability. While acknowledging the considerable burdens that ethical AI literacy imposes on already overstretched professionals, the article maintains that this endeavour is both feasible and necessary, and that libraries have historically risen to comparable technological transformations by redefining professional roles and investing in collaborative capacity building. Ultimately, the article concludes that the cultivation of ethical AI literacy is the most urgent and meaningful work facing digital librarians today, as it determines whether libraries will remain trusted public institutions or become unwitting conduits of automated discrimination, epistemic distortion, and commercial surveillance in the decades ahead.*

Keywords: *Artificial intelligence ethics, digital librarianship, algorithmic bias, metadata justice, intellectual privacy, professional values*

The rapid infusion of artificial intelligence into the fabric of digital library operations has created a peculiar and urgent paradox. At the very moment when librarians are being called upon to integrate machine learning, natural language processing, recommendation algorithms, and automated metadata generation into their daily workflows, the foundational professional commitment to equity, privacy, intellectual freedom, and transparent stewardship has never been more acutely tested. Artificial intelligence is not, despite the breathless rhetoric of vendors and the anxious speculation of pundits, a neutral tool that can be simply deployed and forgotten. It is a sociotechnical system laden with values, assumptions, and power relations that are encoded in its training data, its architectural choices, and its deployment contexts. For digital librarians, who have long prided themselves on being custodians of impartial access and balanced collections, this realisation is deeply unsettling, because it reveals that the algorithms they adopt are not merely faster ways of doing old tasks but are active

agents that shape what users find, how they find it, and what they are led to believe about the world. The development of ethical AI literacy within digital library practice is therefore not an optional continuing education topic or a box to be checked on a strategic plan; it is a core professional competence that will determine whether libraries remain trusted institutions in an algorithmic age or become unwitting conduits of automated discrimination, epistemic distortion, and commercial surveillance.

To speak of AI literacy in a library context is to invoke a term that has undergone considerable conceptual inflation in recent years. AI literacy in the general sense often means little more than public awareness of what AI can and cannot do, a superficial familiarity with chatbots and image generators, and a vague anxiety about job displacement. But ethical AI literacy for digital library practitioners must be something far more rigorous and specific. It is the capacity to critically interrogate AI systems at every stage of their lifecycle, from the conceptualisation of a problem and the selection of training data, through the design and testing of models, to the implementation, monitoring, and eventual retirement of algorithmic tools in library settings. It encompasses technical understanding sufficient to recognise the limitations and biases of different algorithmic approaches, but it is equally rooted in the ethical frameworks and professional values that have guided librarianship for more than a century. Ethical AI literacy, in this sense, is not a departure from traditional librarianship but a deepening of it, because it applies the same principles of intellectual freedom, privacy, neutrality, and equitable access to the new domain of automated decision-making, while also acknowledging that those principles may need to be reinterpreted or even revised in light of the novel harms that AI introduces.

The first and most immediate domain in which ethical AI literacy must be cultivated is that of discovery and retrieval systems. Digital libraries have long relied on keyword searching, boolean logic, and controlled vocabularies to connect users with relevant resources, but these traditional methods are increasingly being supplemented or replaced by machine learning based ranking algorithms, semantic similarity searches, and personalised recommendation engines. These systems are trained on historical usage data, past search logs, and existing catalogue records, all of which carry the accumulated biases of previous cataloguing practices, collection development decisions, and user behaviours. A recommendation algorithm that learns from past circulation patterns will inevitably privilege materials that have been historically favoured by dominant user groups, thereby marginalising resources relevant to underrepresented communities or non-traditional research interests. A relevance ranking model trained on click-through data will amplify popular but superficial content at the expense of deeper, less frequently accessed scholarship. An automated subject classification system derived from existing metadata will replicate and even intensify the outdated terminologies and conceptual frameworks that librarians have been working to decolonise for decades. Ethical AI literacy demands that digital librarians not only recognise these dynamics but also demand transparency from vendors, conduct regular audits of algorithmic outputs, and maintain human oversight over the most consequential ranking and filtering decisions. It requires the courage to disable or refuse algorithmic features that cannot be adequately understood or justified, even when vendors present them as indispensable innovations.

The second critical domain is that of automated metadata generation and enrichment. Digital libraries are overwhelmed by the volume of born-digital and digitised materials that require description, and AI powered tools for optical character recognition, handwritten text recognition, named entity extraction, subject indexing, and automatic summarisation promise to alleviate this bottleneck at unprecedented speed. The appeal is undeniable, particularly for understaffed institutions with vast backlogs of uncatalogued or minimally described collections. However, the ethical perils are equally

substantial. A named entity recognition model trained on a corpus of predominantly Western news texts will perform poorly on non-Western names, historical variants, or indigenous terminologies, effectively erasing those entities from discoverability. An automatic subject indexing tool that maps extracted terms to the Library of Congress Subject Headings will perpetuate the well-documented colonial and patriarchal biases embedded in that vocabulary, assigning headings that misrepresent or stigmatise the very communities whose materials are being described. A handwritten text recognition engine fine-tuned on sixteenth-century Italian humanist scripts will fail disastrously on nineteenth-century Bengali manuscripts, creating transcriptions so error-laden that they mislead researchers rather than assisting them. Ethical AI literacy in this context means that librarians must treat automated metadata not as a finished product but as a rough draft that requires careful human review, contextualisation, and correction. It means conducting rigorous error analysis that disaggregates performance by language, script, time period, and content type, rather than reporting a single aggregate accuracy figure that obscures disparate impacts. It means publishing, alongside the machine-generated metadata, clear provenance statements that disclose the training data, the known limitations, and the confidence levels of the automated processes, so that users can assess for themselves the reliability of what they find.

The third domain, and one that is often neglected in technical discussions, is that of user privacy and data governance. AI systems in digital libraries are voracious consumers of user data. They require search histories, click patterns, reading durations, saved items, and even behavioural signals such as scrolling speed and dwell time to train their models and personalise their outputs. This creates an acute tension with the core library value of intellectual privacy, which holds that what a person reads or researches is their own affair and should not be surveilled, recorded, or commodified. Ethical AI literacy compels librarians to ask difficult questions about data minimisation, informed consent, and purpose limitation. Is it truly necessary to retain every user interaction for the sake of algorithm training, or can anonymised or aggregated data suffice? Are users adequately informed about what data is collected, how it is used, and with whom it is shared, and are they given meaningful choices beyond a binary accept or reject? When vendors or cloud providers host AI services, where do the data reside, who has access to them, and under what legal jurisdiction are they governed? These are not merely compliance questions for legal counsel; they are professional ethical questions that demand active engagement from librarians who understand both the technical affordances of AI systems and the historical precedents for library confidentiality. The development of ethical AI literacy must therefore include a robust component of privacy impact assessment, vendor negotiation skill, and advocacy for regulatory frameworks that protect library users from algorithmic surveillance and commercial exploitation.

Beyond these operational domains, ethical AI literacy also demands a critical examination of the broader epistemic and social implications of AI deployment in digital libraries. When an algorithm recommends, ranks, or summarises, it is not merely organising information neutrally; it is performing a form of curation that privileges certain knowledge claims, certain voices, and certain worldviews over others. This is particularly consequential in digital libraries that serve educational or public functions, where users may lack the domain expertise to recognise when an algorithmic output is partial, outdated, or simply wrong. Ethical AI literacy encourages librarians to frame AI not as a replacement for professional judgment but as a supplementary tool that must be carefully bounded and constantly questioned. It invites librarians to consider whether some functions should never be automated at all, particularly those that involve sensitive or contested materials, such as archival descriptions of indigenous heritage, personal papers of living individuals, or politically charged historical documents. It also invites librarians to think about their role as interpreters and translators

of AI systems for their users, helping them understand how search results are generated, why certain recommendations appear, and how to interrogate the assumptions embedded in the interface. In this sense, ethical AI literacy transforms the digital librarian from a mere system operator into a critical mediator and educator, someone who empowers users to navigate algorithmic environments with the same scepticism and discernment that they bring to evaluating print sources.

The institutional and professional infrastructure required to build ethical AI literacy across the field is substantial and cannot be achieved through sporadic workshops or vendor supplied training modules. It requires a systemic commitment that begins in library and information science education, where curricula must integrate AI ethics not as a standalone elective but as a thread running through cataloguing, reference, collection development, and digital preservation courses. It requires the creation of cross-functional teams within libraries that bring together subject specialists, metadata librarians, systems staff, and ethics officers to collaboratively assess AI tools before acquisition and to monitor their performance after deployment. It requires the development of shared frameworks and checklists, such as the algorithmic impact assessments and model cards that have been proposed in adjacent fields, adapted to the specific contexts of library collections and user populations. It requires, above all, a culture of intellectual humility and professional accountability, in which librarians are willing to admit when an AI system has failed, to correct its errors transparently, and to withdraw it entirely if it cannot be made to align with library values. This culture cannot be mandated from above; it must be nurtured through peer exchange, publication, conference dialogue, and, crucially, through collaboration with the very communities that have been most harmed by algorithmic discrimination, ensuring that their voices and experiences inform the ethical standards that libraries adopt.

Critics may object that ethical AI literacy, as articulated here, places an impossible burden on already overstretched digital librarians, demanding technical sophistication, philosophical depth, and political courage that few professionals currently possess. There is some truth to this objection, and it is precisely why the development of ethical AI literacy must be understood as a collective, long-term endeavour rather than an individual responsibility. No single librarian can master the intricacies of natural language processing, fairness metrics, privacy engineering, and critical algorithm studies all at once. But every library can build teams that collectively encompass these competencies, and every library can participate in consortia and professional networks that pool expertise and share resources. Moreover, it is worth remembering that libraries have faced similarly daunting technological shifts before, from the transition from card catalogues to online public access catalogues, to the adoption of integrated library systems, to the emergence of digital repositories and open access publishing. In each case, the profession rose to the challenge not by demanding that every librarian become a programmer or a systems analyst, but by redefining the division of labour, investing in continuing education, and, most importantly, holding fast to the ethical principles that gave libraries their social legitimacy. Ethical AI literacy is simply the latest iteration of this ongoing process of professional adaptation, and it is no more impossible than its predecessors, provided that the commitment is sincere and the investment is adequate.

The stakes of this commitment could hardly be higher. If digital libraries cede their ethical judgment to commercial vendors and opaque algorithms, they will gradually lose the trust of their users, the distinctiveness of their professional identity, and their capacity to serve as bulwarks against information inequality and epistemic injustice. If, on the other hand, they embrace ethical AI literacy as a core practice, they will not only mitigate the harms of automation but also model a form of responsible innovation that other information institutions can emulate. They will demonstrate that artificial intelligence, for all its power, can be bent toward public good rather than private profit,

toward inclusion rather than exclusion, and toward transparency rather than obscurity. This is not a naive techno-optimism; it is a pragmatic and principled realism that acknowledges both the inevitability of AI in digital library practice and the necessity of shaping it according to humanistic values. The work of building ethical AI literacy is difficult, continuous, and often thankless, but it is also the most urgent and meaningful work that digital librarians can undertake in the present moment. It is the work of ensuring that the libraries of the future remain, in their digital as in their physical forms, places of intellectual freedom, equitable access, and informed citizenship, where algorithms serve people rather than the reverse, and where the transformative potential of technology is realised without sacrificing the fundamental rights and dignity of every user. That is the promise of ethical AI literacy, and it is a promise that digital librarians are uniquely positioned to fulfil.

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