

Building Ethical Infrastructure in Peer Review: Tools for Strategic Evaluation and Reform

Julia Mullen and Ana Lewis

Peer review is widely recognized as a cornerstone of scholarly publishing. It plays a critical role in protecting the quality, credibility, and integrity of academic research. As the publishing landscape evolves through modern technologies, policies, and pressures, so must our approach to peer review, moving beyond assumptions and compliance toward strategic, values-driven infrastructure.

This article introduces 4 practical tools designed to help scholarly stakeholders build and sustain ethical infrastructure in peer review:

- Ethical Infrastructure Pie Chart
- Ethical Infrastructure Checklist
- Audit Scorecard
- Peer Review Ethics Heatmap

Together, these tools respond to a growing need for ethical infrastructure in peer review—resources that are practical, tangible, adaptable, and grounded in the values and challenges faced by stakeholders in scholarly communications. Ethics in peer review should not be assumed, incidental, or a form of compliance; they should be actively supported, transparently communicated, and strategically aligned.

Context

This work originated during our participation in the SSP Fellowship Program, where we developed the Peer Review Ethics Heatmap as part of our poster presentation at the Society for Scholarly Publishing Annual Meeting.¹ Our project explored how peer review models themselves differ

across ethical values to understand why peer review models vary across and within publishers and scholarly industries.

Through that work, we recognized a broader need, not just to compare peer review models but to help scholarly communities understand what ethical values matter most to them and how to strategically evaluate existing ethical infrastructure, leading to the development of the Audit Scorecard, Ethical Infrastructure Pie Chart, Ethical Infrastructure Checklist as well as a comprehensive ethical infrastructure toolkit.

Ethical Infrastructure Tools: What and Why?

Ethical infrastructure tools are pivotal for ensuring that your organization's ethical principles are seamlessly integrated with the peer review practices and other critical dimensions of a comprehensive publishing framework.

Each tool in this article offers a methodical approach to help you assess, rank, and deliberate on the ethical values and layers of a holistic framework most salient to your stakeholders. Ultimately, a heatmap or a data monitoring tool can provide dynamic insights into the intersections and interactions between existing and emerging peer review models and the ethical values that shape the evolving landscape of scholarly publishing.

This catalog of tools may be employed collectively or at distinct stages of your publishing program evaluation to clarify the values that are most closely aligned with your publication's mission. It is equally important to recognize that the peer review process may warrant subtle refinement, targeted adjustments, or comprehensive restructuring. In some cases, these insights may reveal the need for far-reaching, long-term transformation.

Properly Visualizing Ethical Infrastructure

The Ethical Infrastructure Pie Chart (Figure 1) provides a visual representation of the key ethical infrastructure layers that underpin a healthy, honest publishing framework. By mapping each tier, this data allows stakeholders to see at a glance the distribution and relative emphasis

Julia Mullen (<https://orcid.org/0009-0001-0352-5318>) and Ana Lewis (<https://orcid.org/0009-0007-8265-2852>).

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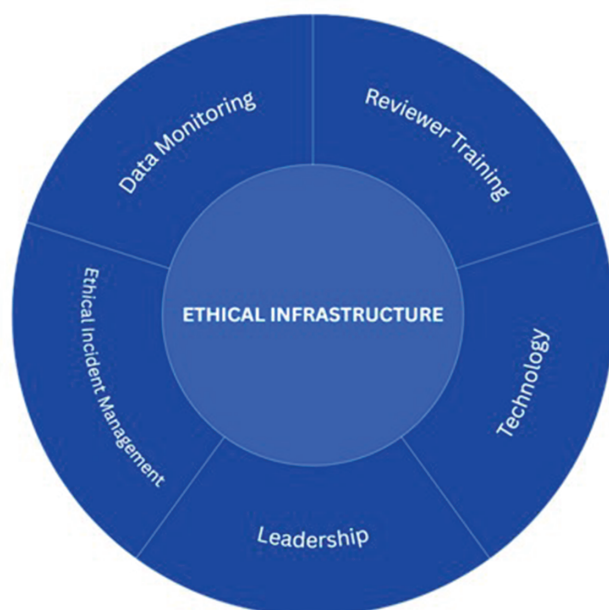


Figure 1. Ethical Infrastructure Pie Chart. A visual representation of the key ethical infrastructure layers that collectively support a sustainable, healthy publishing framework. Credit: Ana Lewis and Julia Mullen.

of these elements within a program. At the center, the chart highlights the overarching goal: a robust and ethical publishing framework that integrates these values into every layer of peer review and editorial decision-making.

Use Case Example: A journal uses the pie chart during an annual editorial board retreat to quickly assess which ethical layers need more resources, leading to the implementation of a new data monitoring dashboard.

Used in conjunction with the Ethical Infrastructure Checklist, Audit Scorecard, and Heatmap, the pie chart helps contextualize ethical priorities across the organization. While the checklist identifies which components are present, the scorecard ranks their relative importance, the heatmap explores alignment with peer review models, and the pie chart offers an intuitive snapshot of an ethical publishing landscape. This visual aid supports reflection, discussion, and strategic planning, enabling teams to identify areas of strength and opportunities for growth within their ethical infrastructure.

Strategic Ethical Infrastructure Evaluation

Next, we turn to the Ethical Infrastructure Checklist (Table), a structured tool designed to help your organization assess whether your publishing program encompasses all essential components of an ethical framework. The checklist prompts critical reflection in several key areas: Is your reviewer pool receiving basic, comprehensive and ongoing training? Is leadership appropriately aligned with your publishing

model, whether through an editorial board or another governance framework? Are mechanisms in place to identify, document, and triage ethical breaches? Do you have robust data visualization or monitoring tools to track and revisit your ethical priorities over time? Is your technology stack current, helpful to your stakeholders, and ready to integrate artificial intelligence (AI) in a way that allows for meaningful human oversight?

Use Case Example: During a quarterly review, a journal manager completes the checklist and discovers the reviewer training program is outdated, prompting a redesign of the onboarding and ongoing education curriculum.

Not intended as a one-time exercise, implementing and refining ethical infrastructure is inherently a long-term process that requires sustained attention and thoughtful evaluation. Each layer of infrastructure interacts with the others, typically enhancing one element often strengthens the entire framework. Over time, the cumulative effect of these improvements can significantly elevate the integrity of your publishing operations.

The Audit Scorecard: Identifying What Matters Most

The Audit Scorecard is a reflective tool designed to assist scholarly communications stakeholders—editors, publishers, reviewers, authors, etc.—in evaluating, ranking, and discussing the ethical values most important to them, notably in the context of peer review.

Rather than prescribing a single ethical framework, the Scorecard invites users to

- rate the importance of each value to their context,
- assess how their current peer review practices align with specific ethical values,
- prioritize which values are most critical to their mission, community, or publishing goals, and
- compare their value priorities with how different peer review models perform on the Peer Review Ethics Heatmap.

Use Case Example: A medical journal's editorial committee receives feedback from authors concerned about inclusivity and fairness in peer review. The editorial team uses the Audit Scorecard to assess where their values are currently. With bias reduction and community engagement emerging as top priorities, they implement reviewer diversity tracking and host webinars on inclusive reviewing practices.

Ethical decision-making in peer review is rarely one-size-fits-all. The Audit Scorecard (Figure 2) supports strategic planning, guiding transitions between peer review models or informing policy development, and facilitates conversations among relevant communities, such as editorial boards,

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Table. Ethical Infrastructure Checklist. Illustrates the key components of the ethical publishing framework: reviewer training, leadership alignment, breach management, data monitoring and artificial intelligence (AI)-ready technology. Credit: Ana Lewis and Julia Mullen.
Instructions: For each question, answer Yes or No.

To be filled out by stakeholder(s)	Yes	No	N/A
Technology			
Are your tools up-to-date and aligned with stakeholder needs?			
Does your system support ethical oversight, including AI integration if applicable?			
Leadership			
Is leadership clearly aligned with your publishing model and ethical priorities?			
Do leaders actively communicate and reinforce ethical standards?			
Reviewer Training			
Are reviewers provided ongoing, comprehensive ethical training?			
Is reviewer performance monitored for adherence to ethical standards?			
Ethical Incident Management			
Is there a clear process for handling ethical breaches?			
Are outcomes and lessons communicated to stakeholders?			
Data Monitoring			
Do you have tools to visualize and track ethical priorities over time?			
Are insights used to prevent issues and improve practices?			

Scoring Guide: 8–10 Yes: Strong ethical infrastructure; 5–7 Yes: Functional, but may need improvement; 0–4 Yes: Needs significant review.

society members, or institutional stakeholders. Note that stakeholders can add additional ethical values as needed in the rows in Figure 2.

From Reflection to Action: How the Audit Scorecard and Peer Review Ethics Heatmap Work Together

Once ethical priorities are identified via the Scorecard, the Peer Review Ethics Heatmap helps evaluate how different peer review models align with those values.

The Peer Review Ethics Heatmap (Figure 3) is a data visualization tool that compares peer review models across a set of ethical criteria. It is not about ranking models as “better” or “worse” but revealing alignment/trade-offs and making informed, values-driven decisions. For example: Open peer review may score highly on transparency and community engagement; double-anonymous and triple-anonymous review may prioritize bias reduction and confidentiality. By cross-referencing your scorecard results with the heatmap, you can identify which models best support your community’s values and where compromises may be necessary.

This pair of tools supports strategic alignment between peer review practices and stakeholder priorities: choosing or adapting peer review models and processes that reflect your community’s values, not just tradition or convenience.

How We Built the Heatmap

To ensure the heatmap reflects real-world publishing ethical discourse, we conducted a comprehensive review of 21 sources from publishers, ethics organizations, and scholarly communication authorities.² We analyzed the frequency of ethical keywords to identify the most consistently emphasized values across the scholarly publishing, as seen in Figure 4.

- Bias Reduction and Confidentiality emerged as the most frequently cited values.
- Quality, Transparency/Accountability, and Efficiency followed closely.
- Community Engagement/Collaboration and Credit/Recognition were also notable, with the former gaining momentum in current discourse.

This analysis grounds the Heatmap in how publishing stakeholders actually talk about ethics, not just theoretical ideals.

Tools for a Changing Landscape

How is the heatmap relevant to the scholarly communications industry today? For example, as technologies like AI become more integrated into scholarly publishing, ethical priorities are shifting. The following questions and ethical values may become more urgent:

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ETHICAL VALUE	DESCRIPTION	SCORE (1: LEAST IMPORTANT; 5: MOST IMPORTANT)
Bias Reduction	The extent to which peer review processes actively mitigate conscious or unconscious bias related to identity, affiliation, geography, or other personal/contextual factors.	
Confidentiality	The safeguarding of sensitive information throughout the peer review process, including the anonymity of reviewer identities, protection of classified data, and preservation of unpublished content.	
Transparency/ Accountability	The clarity and openness of the peer review process, including transparent decision-making, clear attribution of responsibility, and disclosure and management of conflicts of interest.	
Community Engagement/ Collaboration	The extent to which peer review processes invites input and fosters dialogue across the broader scholarly community, including authors, reviewers, and readers.	
Efficiency	The degree to which peer review processes are self-sustaining and well-balanced, ensuring timely evaluations and effective use of resources, including reasonable turnaround times and equitable workload distribution. (Note: If not high, ongoing evaluation is needed to sustain performance.)	
Quality Assurance	The ability of the peer review process to uphold research integrity, rigor, and reliability through expert evaluation, critical analysis, and constructive critique.	

Figure 2. Audit Scorecard. Accompanying the Peer Review Ethics Heatmap, it helps determine the ethical values most important to scholarly publishing communities/stakeholders. Ethical values listed are pulled from quantitative data in Figure 4. Credit: Julia Mullen and Ana Lewis.

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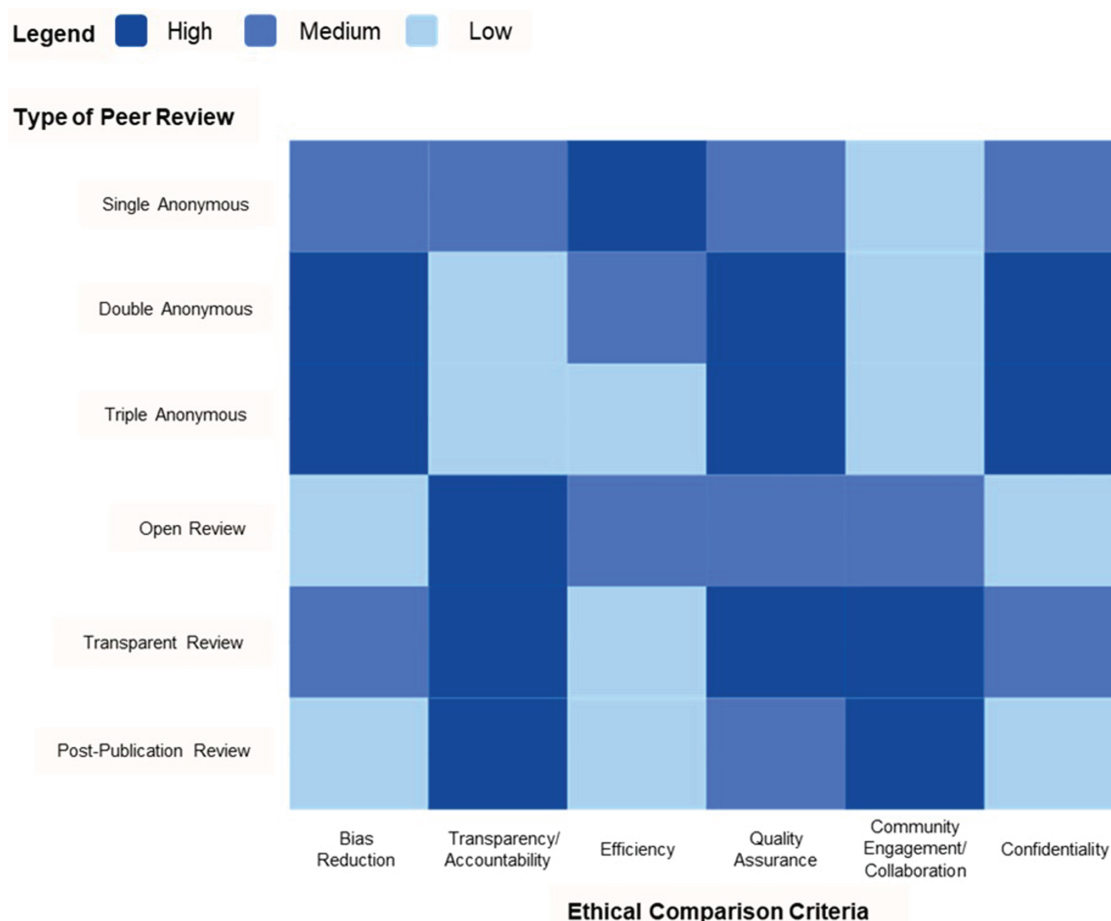


Figure 3. Peer Review Ethics Heatmap. Compares peer review models across specific ethical values. Ethical values listed are pulled from quantitative data in Figure 4. Credit: Julia Mullen and Ana Lewis.

- **Transparency:** Who or what contributed to the work?
- **Accountability:** Who is responsible for AI-assisted decisions?
- **Quality/Integrity:** Is the contribution original and traceable?
- **Confidentiality:** Can AI access unpublished manuscripts?
- **Efficiency:** How do we manage increasing submission volumes?
- **Bias Reduction:** How do we ensure that our tools and processes do not introduce or amplify bias in peer review, editorial decisions, or publication practices?

These shifting priorities can inform which peer review model best supports your communities' missions. So, the heatmap is not static but a strategic tool to help you ask the following questions: What values matter most to us right now? How do our current peer review practices support or conflict with those values? How can we adapt as those values evolve, or

how can we evolve our peer review system to better reflect our values and mission?

The heatmap is designed to evolve alongside these changes. Future iterations may incorporate new values surfaced through scorecard use, community feedback, etc.

Use Case Example: A university press is considering AI tools to assist with reviewer selection. Before implementation, they used the scorecard to identify their top ethical values, applying those values to the heatmap to assess how different peer review models handle confidentiality and bias reduction. The analysis leads them to adopt a double-anonymous model with human oversight of AI-generated suggestions, ensuring ethical safeguards are in place.

Together, the heatmap and scorecard form a 2-part framework. The scorecard is the starting point. It helps individuals and communities identify and articulate the ethical values that matter most to them. By encouraging reflection and prioritization, the scorecard reveals the ethical criteria that should guide peer review processes and decisions.

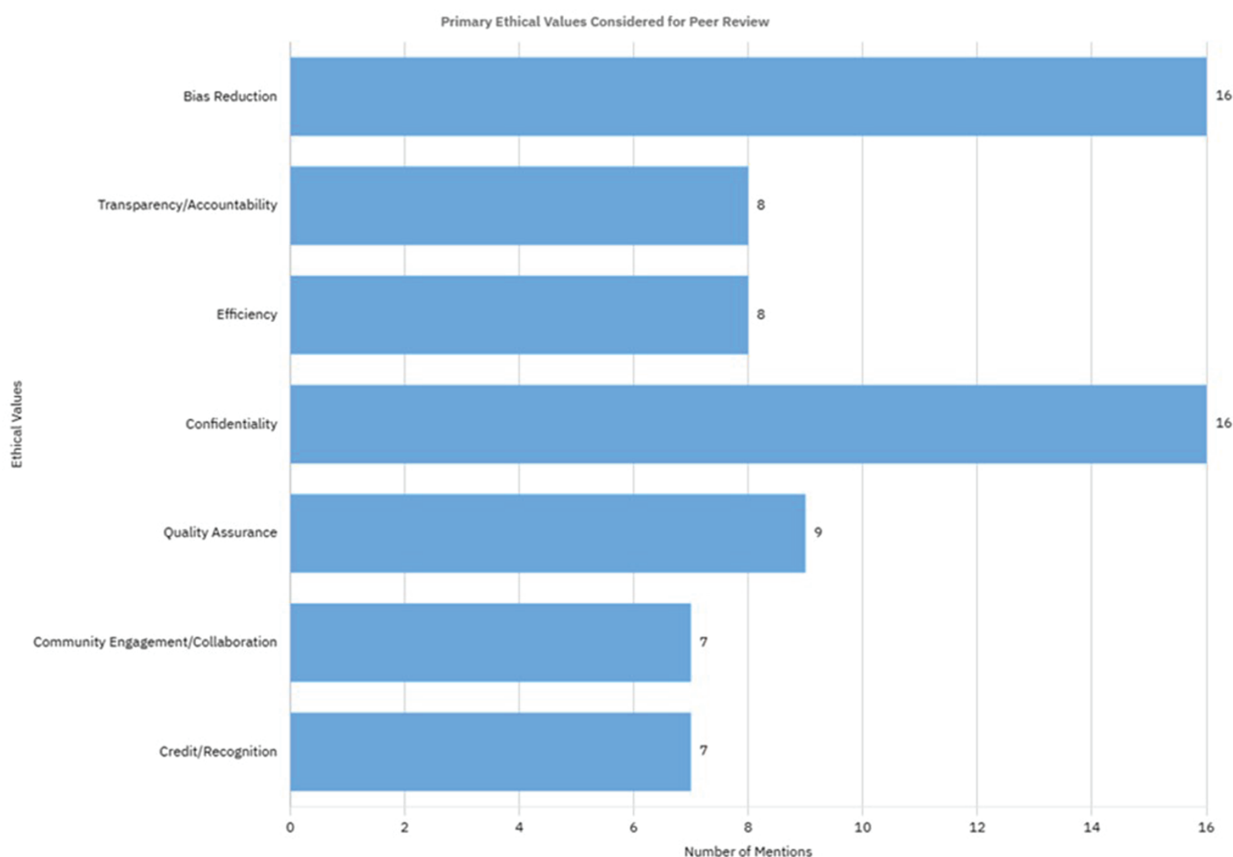


Figure 4. Primary Ethical Values Considered for Peer Review. A bar graph illustrating the primary ethical values held in importance in the scholarly communications industry. Credit: Julia Mullen and Ana Lewis.

Once those priorities are clear, the heatmap turns into a powerful comparative tool that allows users to evaluate how different peer review models align with their identified values, making it easier to select or advocate for models that best support their ethical goals. In this way, the scorecard informs the interpretation of the heatmap. This approach recognizes that the “best” peer review model depends on ethical context, and that communities are best served when they choose models that reflect their own values. This pairing empowers publishing communities to make more intentional and value-aligned decisions about peer review reform.

Conclusion

The Ethical Infrastructure Pie Chart, Ethical Infrastructure Checklist, Audit Scorecard, and Peer Review Ethics Heatmap serve as adaptable, practical tools to help scholarly publishing stakeholders reflect on their values, evaluate their current practices, and make informed decisions about how to structure peer review in ethically aligned ways. However, these tools are just the starting point. The real work happens in conversation, collaboration, and commitment to continuous improvement.

Next steps:

- Screen current key layers using the Ethical Infrastructure Pie Chart with your editorial office, publishing team, or community to determine which layers are or need to actively contribute to your publishing program.
- Strategically evaluate the core values of your publishing program, using the Ethical Infrastructure Checklist, to identify weaknesses and evolving needs, ensuring alignment with industry trends and audience expectations.
- Use the Audit Scorecard with your editorial board, publishing organization, or community to identify your top ethical priorities.
- Compare your values to the Peer Review Ethics Heatmap to evaluate how well your current peer review model aligns, or where it may need adjustment.
- Facilitate conversations: Use these tools together in workshops, strategic planning sessions, or policy reviews to build consensus and drive change.

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- Share feedback: These tools are designed to evolve. We welcome discussion on how they are used and can better serve the scholarly communications industry.

Since publishing and ethical values are not static, neither is the framework that we use to evaluate them. Deliberate reflection and assessment of your own values and existing ethical infrastructure are imperative to remain attuned to these evolving principles and the scholarly publishing industry.

Ethical infrastructure is not just about compliance—it's about building systems that reflect and reinforce the values we aspire to uphold. By embedding ethics into the design and evaluation of peer review, we can foster greater trust, accountability, and inclusivity in scholarly communications.

References and Links

1. <https://doi.org/10.14293/s2199-ssp-am25-01005>
2. <https://tinyurl.com/2kffv27k>