JLSC

ISSN 2162-3309 | JLSC is published by the Iowa State University Digital Press | http://jlsc-pub.org

Volume 12, 2 (2025)

The Journal of Open Source Software (JOSS): Bringing Open-Source Software Practices to the Scholarly Publishing Community for Authors, Reviewers, Editors, and Publishers

Patrick Diehl, Charlotte Soneson, Rachel C. Kurchin, Ross Mounce & Daniel S. Katz

Diehl, P., Soneson, C., Kurchin, R.C., Mounce, R. & Katz, D.S. (2025). The Journal of Open Source Software (JOSS): Bringing Open-Source Software Practices to the Scholarly Publishing Community for Authors, Reviewers, Editors, and Publishers. *Journal of Librarianship and Scholarly Communication*, 12(2), eP18285. https://doi.org/10.31274/jlsc.18285

This article underwent semi-anonymous peer review in accordance with JLSC's peer review policy.

ISSN 2162-3309 10.31274/jlsc.18285

PRACTICE ARTICLE

The Journal of Open Source Software (JOSS): Bringing Open-Source Software Practices to the Scholarly Publishing Community for Authors, Reviewers, Editors, and Publishers

Patrick Diehl
Los Alamos National Laboratory
Charlotte Soneson
Friedrich Miescher Institute for Biomedical Research and SIB Swiss Institute of Bioinformatics
Rachel C. Kurchin
Carnegie Mellon University
Ross Mounce
Arcadia | ROR ID: https://ror.org/051z6e826
Daniel S. Katz
NCSA & CS & iSchool, University of Illinois Urbana-Champaign

ABSTRACT

Introduction: Open-source software (OSS) is a critical component of open science, but contributions to the OSS ecosystem are systematically undervalued in the current academic system. The *Journal of Open Source Software* (JOSS) contributes to addressing this by providing a venue (that is itself free, diamond open access, and all open-source, built in a layered structure using widely available elements/services of the scholarly publishing ecosystem) for publishing OSS, run in the style of OSS itself. A particularly distinctive element of JOSS is that it uses open peer review in a collaborative, iterative format, unlike most publishers. Additionally, all the components of the process—from the reviews to the papers to the software that is the subject of the papers to the software that the journal runs—are open.

Background: We describe JOSS's history and its peer review process using an editorial bot, and we present statistics gathered from JOSS's public review history on GitHub showing an increasing number of peer reviewed papers each year. We discuss the new JOSSCast and use it as a data source to understand reasons why interviewed authors decided to publish in JOSS.

Discussion and Outlook: JOSS's process differs significantly from traditional journals, which has impeded JOSS's inclusion in indexing services such as Web of Science. In turn, this discourages researchers within certain academic systems, such as Italy's, which emphasize the importance of Web of Science and/or Scopus

Received: 07/29/2024 Accepted: 10/31/2024

indexing for grant applications and promotions. JOSS is a fully diamond open-access journal with a cost of around US$5 per paper for the 401 papers published in 2023. The scalability of running JOSS with volunteers and financing JOSS with grants and donations is discussed.

Keywords: open access, open peer review, open-source software, open science, open scholarship

INTRODUCTION

Open-source software (OSS) is a critical component of open science, but contributions to the OSS ecosystem are systematically undervalued in the current academic system. The *Journal of Open Source Software* (JOSS) is a step towards addressing this, by providing a venue (that is itself free, diamond open access, and all open-source, built in a layered structure using widely available elements/services of the scholarly publishing ecosystem) for publishing OSS. For a detailed description of JOSS's infrastructure, we refer to Smith et al. (2018). JOSS uses an open, conversational review process focused on testing the software and verifying the adoption of best practices such as documentation and testing. In addition to the software itself, a short paper describing its purpose and features is reviewed. The review of the software adopts techniques from the open-source community (Tennant et al., 2020). Open-source projects are hosted open access on commercial platforms, like GitHub, or are community-hosted, like GNU Savannah. These platforms host the code and, in addition, provide features like ticket systems to report bugs or feature requests. Users prepare pull requests to suggest code changes or new features. Other users review these pull requests and make suggestions to improve the code quality. We adopt the tools provided by GitHub to suggest changes using pull requests and open tickets for encountered bugs or issues while testing the software. Because open peer reviews are very common in the OSS community, the JOSS review process is a familiar modality (Dabbish et al., 2012; Tennant et al., 2017).

BACKGROUND

JOSS published its first paper in 2016. The journal launch was supported by submissions in the inaugural year from well-known individuals in the open science/OSS world, including Julia Silge, C. Titus Brown, Dirk Eddelbuettel, Jake VanderPlas, and Daniel Foreman-Mackey. From the start, the journal used a "diamond open-access" model (Mac Síthigh and Sheekey, 2012), with no author or reader charges. There *are* financial costs associated with running the journal, which are discussed later, but these costs are met neither by authors nor by readers.

JOSS is exceptional among diamond open-access journals in a number of ways. The first is by volume of articles published per year: JOSS is very high volume for a diamond open-access

journal. In 2023, JOSS published over 400 articles. Both data collected by Directory of Open Access Journals (DOAJ) and, separately, survey data collected by the OA Diamond Journals Study (Bosman et al., 2021a; Bosman et al., 2021b) (referred to as OADJS from here on) show that diamond open-access journals publishing more than 100 articles per year are rare. In the OADJS, only 40 out of 1,620 journals (2.5%) reported publishing more than 100 articles per year. An analysis of DOAJ data similarly shows that 224 diamond open-access journals out of 8,000 (2.8%) published 100 or more articles in the year 2019 (Mounce, 2020).

A second area where JOSS is exceptional is its peer review modality. At JOSS, the authors know the identity of the reviewers and vice versa, *and* all of the editorial comments and the exchanges among the reviewers, authors, and editors are openly available alongside the paper, within a GitHub issue thread, while the review is in progress (and remain accessible after publication). Again, the survey responses from the OADJS show that this high degree of openness of peer review is atypical among diamond open-access journals—only 19 out of 1,620 surveyed report either "Author and reviewer identities known to each other" or "Reviewer identities published". Unfortunately, the OADJS did not capture any data on which journals publish the content of peer review reports, but to our knowledge, this is also very rare among diamond open-access journals, as well as in the scholarly publishing ecosystem broadly. The vast majority (>88%) of diamond open-access journals tend to use either "single-blind" or "double-blind" peer review (Bosman et al., 2021a; Bosman et al., 2021b). While we acknowledge that publishing peer review reports became routine for some fee-charging open-access journals as far back as 2001, e.g., *BMC Pediatrics* and *Atmospheric Chemistry and Physics* (Wolfram et al., 2019), it is important to note that JOSS implements open peer review *in combination* with a "no fees" diamond open-access publishing model.

A third strength of JOSS is its citedness. According to OpenAlex data (OpenAlex, 2024a), the 2,264 articles published in JOSS between 2016 and 2023 have been cited over 67,400 times as of July 17, 2024, with a median number of 3 citations and a mean just below 30. As for individual papers, one paper published in JOSS in 2019 has been cited over 11,000 times as of July 17, 2024 (Wickham et al., 2019). The citedness of a journal is known to be heavily affected by the subject area it publishes in, e.g., cancer research tends to be much more highly cited than art history (Seglen, 1997). We suggest an appropriate comparator for journal-level citedness to JOSS is *SoftwareX* (ISSN: 2352-7110), an Elsevier journal that started publishing in 2015 and is also open access (albeit with author fees). Between 2016 and 2023, the 1,154 articles published in *SoftwareX* have been cited 12,058 times according to OpenAlex data (OpenAlex, 2024b)—a median of 3 and mean of 10.45 citations per article published at *SoftwareX*. We do not know why *SoftwareX* has published fewer papers than JOSS, but we speculate

that many factors may be involved, including (a) the publishing charge of US$970 levied by *SoftwareX*; (b) authors choosing to boycott Elsevier (The Cost of Knowledge, 2012); (c) the lack of publication of accompanying peer review reports at *SoftwareX* ("black-box peer review") in comparison to JOSS's open process; and (d) the culture of Elsevier and its community and systems (e.g., Editorial Manager) that are not as familiar and friendly to software developers as JOSS's (e.g., GitHub).

A fourth strength of JOSS is the rigor of its peer review process. As part of policy at JOSS, peer reviewers are *required* to install the software they are reviewing, "and to verify the core functionality of the software" (JOSS, 2024). There is no such strict requirement at other software-relevant journal venues, e.g., *SoftwareX*, and "application notes" at *Bioinformatics* (ISSN: 1367-4811). This introduces an important aspect of care for reproducibility and rigor at JOSS. Written claims made in submitted manuscripts about the functionality of software are actually tested by JOSS peer reviewers. Journals such as *Biostatistics* (ISSN: 1468-4357) and *Organic Syntheses* (ISSN: 0078-6209) are rare comparators in different disciplines where peer reviewers are required to reproduce certain claims made in submitted manuscripts.

JOSS

Figure 1 sketches the publication workflow of JOSS. Each JOSS submission is a short paper (typically about 1,000 words) describing the associated open-source software's functionality. The focus of a JOSS submission is on the software itself, not on specific results generated by the software. JOSS's goal is to make it easy for software developers to create a submission, and much of the content for the short paper is typically already available in the software's documentation. The authors use a simple form to submit the short paper and the software, where it is assigned to a track based on the subject specified by the submitter. JOSS relies on GitHub, a software development and social coding platform that facilitates many features of the open-source community, such as code reviews. (Note that the journal infrastructure is independent of GitHub and could alternatively run on GitLab or on a self-hosted GitLab server.) JOSS also has developed and uses a command-driven bot named editorialbot to simplify how editors, reviewers, and authors work with its infrastructure. When a paper is submitted, editorialbot presents some statistics about the software and checks whether the paper meets some of JOSS's submission guidelines. Using this and reviewing the submission (both the paper and software), the track editor checks whether the paper is in scope (it is research software and has involved significant development effort). If so, the track editor assigns the submission to an editor. The editor assigns reviewers (considering suggestions from the author) and starts the review. Each reviewer then uses the editorial bot to generate a checklist for their review. The generated checklist covers both the short paper and the software, where reviewers install

the software, run examples, and read the documentation. The reviewers communicate with the authors on GitHub as they work through their review checklists. The authors address the reported issues until the reviewers check the item from their list. Once all reviewers have completed their checklists, the editor does a final check on the paper. After that, the author is asked to store a copy of the software on Zenodo or a similar archival repository, and the DOI where it is archived is added to the paper. After the paper is recommended for acceptance by the editor, the track editor checks the submission and its metadata and publishes the paper in JOSS by submitting it to Crossref.

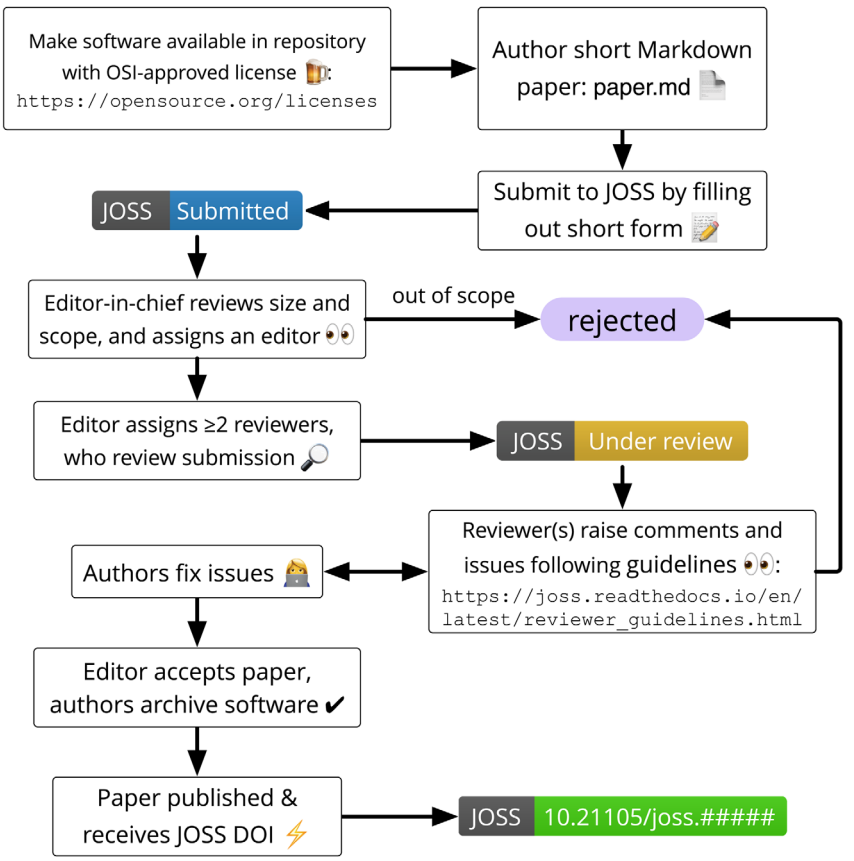

Figure 1. Publication workflow of the *Journal of Open Source Software* (JOSS), from submission through pre-review activities (scope check, editor and reviewer assignment), review, and acceptance and publication (Niemeyer, 2017).

Because JOSS is part of the open-source research software ecosystem, it tries to work with other parts of the same ecosystem. One example of this is partnerships with other research

software review communities for R and Python software, rOpenSci (Boettiger et al., 2015) and pyOpenSci (pyOpenSci, 2024) respectively. If JOSS receives software that has been reviewed by one of these communities, it can use an expedited review process that focuses on the paper, which has not been reviewed yet. Another example is a partnership with the American Astronomical Society (AAS). If a paper with science results that relies on new software is submitted to AAS, the authors are asked to submit the software to JOSS, while the AAS review process focuses on the science results. Assuming both reviews succeed, the two papers are published and linked to each other via citation and publication (Crossref) metadata.

Similarly, JOSS uses open-source tools where it can. For example, JOSS authors create their paper as a Markdown file with linked figures and a BibTeX file for references in their repository. JOSS uses Pandoc (MacFarlane et al., 2024) to compile this to PDF at submission, and later as needed (via a bot command); at the time of acceptance, JOSS also compiles it into Journal Article Tag Suite (JATS).

Working with other parts of the publishing ecosystem, when a review is complete, JOSS asks the author to archive the software in an archival repository (e.g., Zenodo, figshare, or an institutional repository) and adds the DOI for the software to the paper. JOSS then submits the compiled PDF and JATS files, along with XML metadata, to Crossref upon publication and, finally, uses Portico to preserve these files along with an export of the review thread from GitHub.

Publication volume

JOSS began with an editorial team of 11 members, and published its first paper in May 2016. It published about 100 papers in its first year and has now published over 2,500, currently publishing ~1.3 papers/day (Figure 2A). The editorial team has grown considerably from the start, currently consisting of 91 members. Since 2016 and as of July 17, 2024, 139 different editors have handled at least one published paper (Figure 2B).

JOSS is also a community. As discussed below, this community directly includes over 5,000 editors, authors, and reviewers, and indirectly, it also includes readers and users of software that is published in JOSS. Over time, the JOSS community and the larger open-source research software community have changed their opinions about good software practices, and this has been reflected in changes in JOSS practices, such as in expectations about testing

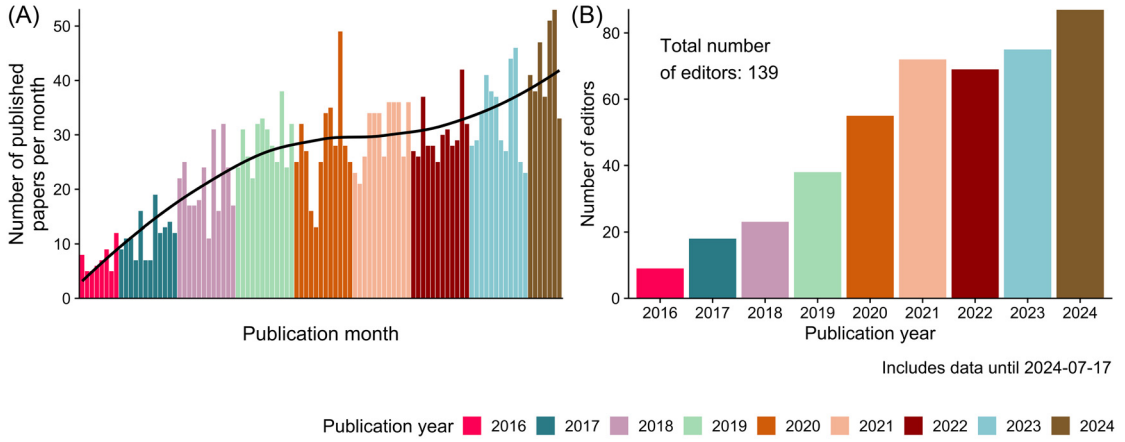

Figure 2. (A) The number of papers published by JOSS each month since its inception in 2016. The smooth curve represents a LOESS fit to the monthly data. (B) The number of distinct editors accepting at least one submission in a given year.

and packaging, which have become more strict over time. JOSS follows the leading edge of the community and helps pull the rest of the community along.

Peer review model

JOSS uses two GitHub issues for each submission, one for pre-review discussion and one for the review itself. Interaction with potential reviewers normally happens in the pre-review issue, along with assignment of reviewers to the submission. Once basic checks have been completed and reviewers assigned, the handling editor triggers creation of the review issue, where the main interaction between reviewers, authors, and the editor occurs. Of course, if a new reviewer needs to be added during the review process (e.g., if a reviewer finds a conflict or drops out of the process and needs to be replaced), that may happen in the review issue.

The role of the editor is to find at least two reviewers, and often three if possible or if multiple types of expertise are needed (Figure 3A). Reviewer selection may be based on author suggestions (which are requested when a submission enter the JOSS system), a list of people who have agreed to review for JOSS (with some history of their current and past reviewing for JOSS, if any), as well as the editor's own knowledge, supplemented by an AI-driven service that finds the five most similar prior JOSS publications to the current submission, suggesting that authors or reviewers of those might be suitable for the current one. JOSS has a large reviewer pool, and every year hundreds of individuals review submissions

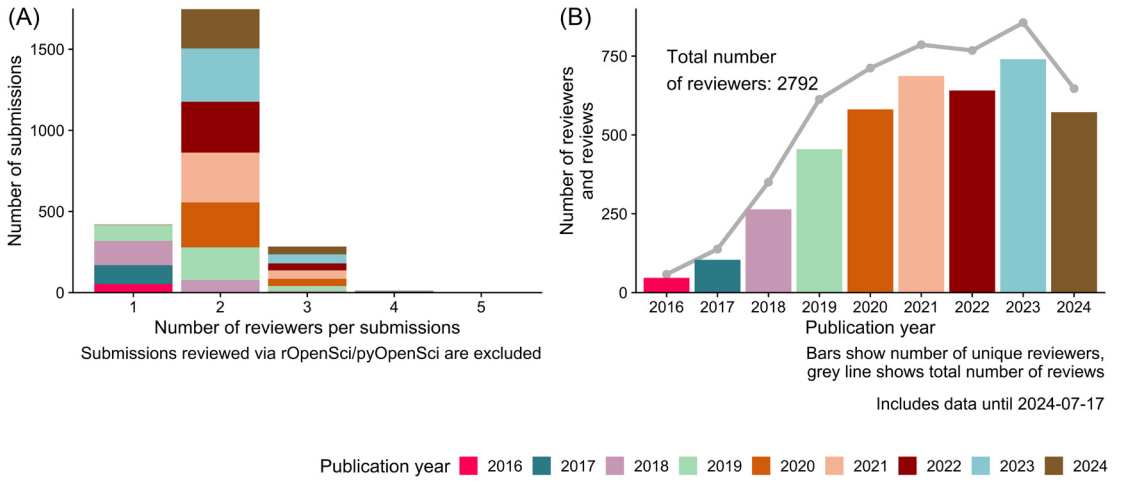

Figure 3. (A) Distribution of the number of reviewers assigned to a JOSS submission. All submissions since 2020 were evaluated by at least two reviewers (with the exception of two published addenda, and noting that in three cases, the second review was completed by the editor after the reviewer dropped out of the review process). (B) The number of reviewers evaluating at least one JOSS submission in a given year, as well as the total number of reviews performed that year.

(Figure 3B). Once at least two reviewers are assigned, the editor can start the review itself. The full process of seeking and inviting reviewers, including author recommendations and decisions by potential reviewers, is public and is captured in the pre-review issue, except for some queries to potential reviewers that may happen by email.

In the review, the reviewers seek to verify that the submission meets 18 criteria on a checklist (https://joss.readthedocs.io/en/latest/review_checklist.html). If a reviewer can check off an item, they do. If they cannot, they either add a comment in the GitHub review issue with a question or comment, create a new issue in the repository that contains the software and the paper source that is being reviewed, or create a pull request to suggest a specific change. The editor's job at this point is to make sure the discussion moves towards a resolution and happens in a respectful manner. Because this discussion occurs in the open, other reviewers, other authors (besides the lead), and other members of the public may also contribute to it. Typically, this discussion leads to a resolution, though in a small fraction (<5%) of reviews, the authors may not wish to make the changes the reviewers and editor agree are needed, and withdraw the submission. JOSS encourages a conversational review style, where the authors and reviewers discuss improvements to the software, and in many cases dozens of comments are made in the review issue in the process (Figure 4A). The median time from submission to publication is 100 days (Figure 4B), with the formal

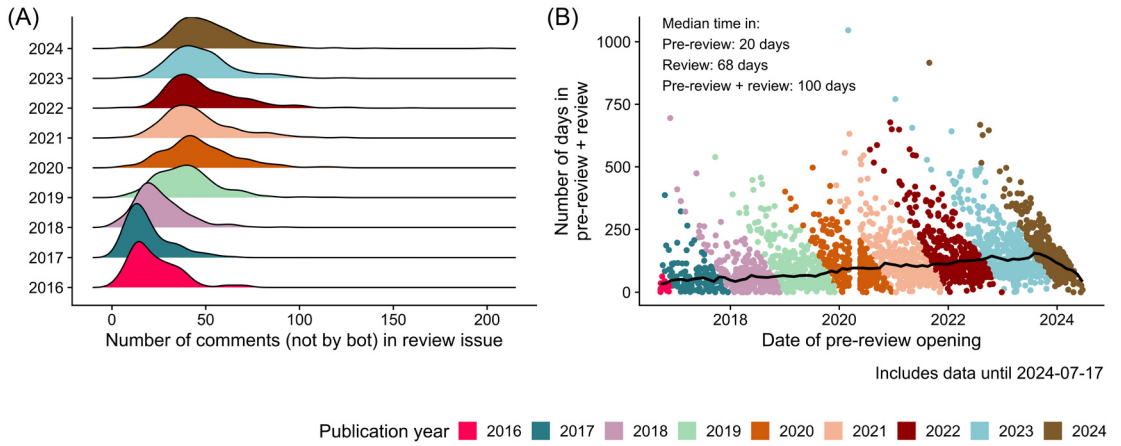

Figure 4. (A) Distribution of the number of comments made in the review issue for JOSS submissions (note that reviewers typically also open issues in the repository of the software being reviewed, but these are not captured in this figure). Comments made by the JOSS editorial bot are excluded. (B) The total time spent in pre-review and review states.

review process (starting once the reviewers are secured) representing approximately two thirds of this time.

While the advantages (e.g., increased transparency, increased integrity of reviews, documented editorial decisions) and disadvantages (e.g., fear of reprisal for critical reviews) of open peer review have been studied previously (Tennant et al., 2017), JOSS has found a few new things that are related to the fact that the review itself is public while it happens, rather than just having the reviewers' identities be public after the review. Specifically, reviewers and editors may volunteer for submissions they think will be highly cited (as they will be associated with these in the future), and reviewers or editors may also be reluctant to work on submissions that they do not think will be well-cited; good reviewers become known to all editors, which can lead to their overuse and burnout; authors can chase reviewers directly when they feel the review is going too slowly; cultural mismatches can lead to misunderstandings without the formality and controls of traditional review systems.

In January 2024, the "JOSSCast: Open Source for Researchers" podcast was launched, which features interviews with developers published in JOSS. These interviews offer some perspectives from the author side of the journal experience. In particular, in 11 of the 14 episodes published as of initial submission of this article, the hosts specifically asked the guests a question about their choice of JOSS and/or experience with the process. Several key ideas emerged repeatedly:

1. The uniqueness and importance of **code review** to the JOSS publication process: While some other venues exist for publication of scientific software, they rarely if ever explicitly focus on the code in the review process.
2. Improvements to software **documentation**: Because the documentation ("docs") of the software is the key venue to get started using it, reviewers frequently engage with it extensively, and authors noted that, as a result of this, they felt the documentation improved substantially through the review.
3. **Reproducibility**: Several authors mentioned the importance of reproducibility and how JOSS contributes to this through its review checklist that ensures software follows best practices for documentation, testing, etc.
4. **GitHub** as venue: As mentioned above, because JOSS is focused on publishing software and GitHub is used extensively in the developer community, the workflow is familiar.
5. **Focus on software/tools** rather than research results: While JOSS is not unique in this regard (see e.g. *Computer Physics Communications*), it is nonetheless unusual as a journal focused on publishing scientific software itself rather than results produced with it.
6. **Open review**: Several authors specifically mentioned that they appreciated the open review process.

The frequencies of mention of these ideas across episodes released as of initial submission are summarized in Figure 5.

JOSS costs

Financially, JOSS has very low operating costs. In 2019, JOSS calculated the cost of publishing each paper as about US$3/paper (Katz et al., 2019). Today, a more accurate cost is probably around US$4–US$5 per paper, though this has not been formally calculated. Costs include services such as web hosting, Crossref membership and services, Portico preservation services, etc. These costs are covered by donations from members of the community, including sometimes from authors who have published papers as well as US$50 for each paper that comes from AAS (24 such papers have been published by JOSS). JOSS also uses paid services such as readthedocs, which is ad-supported (in a way that does not interfere with the documentation). In addition, JOSS has been supported by a US$20,000 gift from the Gordon and Betty Moore Foundation to start up the journal infrastructure and a US$380,000 grant from the Alfred P. Sloan Foundation to improve the infrastructure and generalize it to be useful to other parts of the scholarly publishing community.

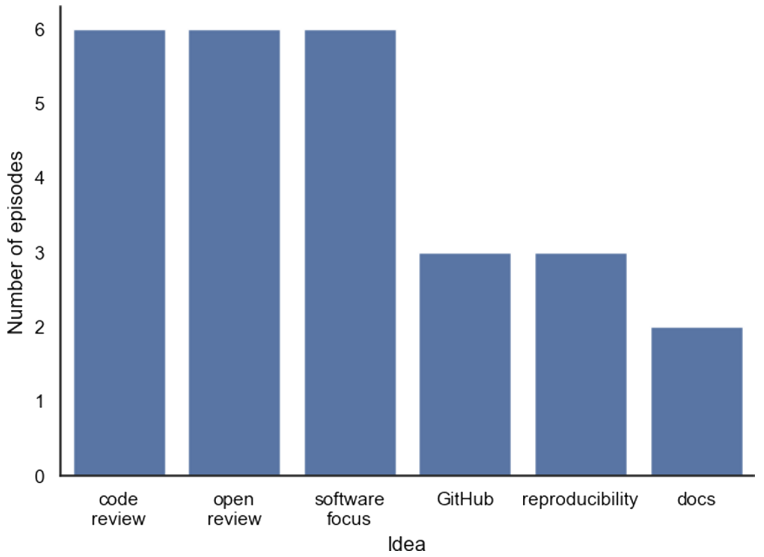

Figure 5. Number of JOSSCast episodes (out of 11 released as of initial submission of this article that specifically asked) in which authors, when asked about their choice of JOSS or experience with JOSS, mentioned each of six key ideas. Papers analyzed span six of the eight topical tracks and were published between March 2023 and April 2024.

2023 Funding and author information

Approximately 70% of 401 papers published in JOSS in 2023 acknowledge some form of research funding support, with the (U.S.) National Science Foundation, the European Research Council, and the (U.S.) Department of Energy being some of the most frequent funders of research in this journal.

Examining the countries listed by authors of JOSS papers published in 2023 in their affiliations, we find that the largest number of papers had authors who listed the United States (153), followed by Germany (80), the UK (53), and France (42). Overall, JOSS papers during this period primarily included authors who indicated that they were affiliated with institutions in Europe & Central Asia (254) and North America (171).

METHODS

Since 2020, JOSS has provided a public summary of the papers published to date (https://www.theoj.org/joss-analytics/joss-submission-analytics.html), with the source code that generates this also being public (https://github.com/openjournals/joss-analytics). A broad range of data about the submissions, including DOI, authors, editor and reviewers, programming

language(s) employed, time spent in JOSS review, software license, and citation information, are retrieved from Crossref, OpenAlex, the JOSS API, GitHub repositories of the published software packages, and the Open Citations Corpus, using R packages rcrossref (Chamberlain et al., 2024), gh (Bryan and Wickham, 2024), openalexR (Aria et al., 2024), and citecorp (Chamberlain, 2020). The summary is automatically updated weekly using GitHub Actions. The data used in this paper are available on GitHub (https://github.com/csoneson/joss-jlsc-2024). All the code used to access the data and create the summary plots is included in the summary, providing full transparency and reproducibility. The final curated data in tabular form, as well as current and historical versions of the summary data and the generated figures, can also be downloaded. Figure 2, 3, and 4B in this article were generated based on summary data from this repository. The number of comments made for each review issue (Figure 4A) was retrieved using the gh R package. Citation information was retrieved from OpenAlex using the openalexR package. Information about 2023 JOSS papers (funding source, author countries) was manually extracted from all papers published in 2023, via a crowd-sourcing activity involving several JOSS editors. For each paper, the rater determined whether or not it reported any supporting funding sources (and also recorded the names of these) as well as determined which countries were listed in the affiliations of the authors, so that a country being entered indicates that one or more authors listed an affiliation in that country. All code used for the current article is openly available (see "Data availability").

Note that most of the authors are JOSS editors or associate editors-in-chief, so some of the opinions in this paper are also based on our experience with JOSS. However, we are also involved in other journals in similar roles, and we believe that our comments reflect a variety of publishing experiences.

DISCUSSION AND OUTLOOK

The review process of JOSS differs significantly from traditional journals. For instance, it has an editorial bot, features open peer review, and operates without a physical office. These deviations from the norm have impeded JOSS's inclusion in indexing services such as Web of Science. Notably, certain academic systems, such as Italy's, emphasize the importance of Web of Science and/or Scopus indexing for grant applications and promotions (Franceschini and Maisano, 2017; Jappe, 2020). As JOSS is not yet indexed in Web of Science or Scopus, scholars in such countries may refrain from submitting their work to JOSS due to these regulatory constraints (Mounce, 2024). Despite the JOSS editorial team formally applying multiple times (https://github.com/openjournals/joss/issues/153) to have Scopus and Web of Science index the journal, to date, neither Scopus nor Web of Science have chosen to index JOSS. For the sake of those in the JOSS community who are employed in places like Italy with "inappropriate" (Franceschini and Maisano, 2017) research evaluation methods, JOSS will

continue to apply to be indexed in Scopus and Web of Science. We note that many other journal evaluators have determined that JOSS is a worthy journal—it is included in DOAJ (https://doaj.org/toc/2475-9066), PubMed Central, the Norwegian Register (https://kanalregister.hkdir.no/publiseringskanaler/KanalTidsskriftInfo.action?id=492835), the Danish Bibliometric Research Indicator (BFI) list, and the Australian Research Council's Excellence in Research for Australia (ERA) 2023 list.

Another area worth revisiting is the cost for JOSS to publish a paper, about US$5 as discussed earlier, similar to the US$6.50 cost for the *Journal of Machine Learning Research* (Schieber, 2012). While other journals' publishing costs are generally not public, the article processing charge (APC) paid for open access often ranges from US$100 to US$12,290 per paper. An investigation of the relationship between the "sticker price" of the APC and the actual publication costs incurred per paper (Grossmann and Brembs, 2021) would be worthwhile. One could investigate the overall cost of diamond open-access journals like JOSS versus APC-based venues like *SoftwareX*. For example, if the 1,374 papers published by *SoftwareX* between 2016 and 2024 had instead been published by JOSS, arguably the academic community would have saved up to US$1.3 million in publication charges (assuming all papers published at *SoftwareX* paid the US$970 APC, though there are fee waivers and discounts [https://www.sciencedirect.com/journal/softwarex/publish/open-access-options] available to a narrow band of authors and circumstances). Set against the backdrop of the multi-decadal "serials crisis" (Guédon, 2001), where both journal subscription fees and APCs are both rising at "unsustainable" (Jurchen, 2020) rates higher than inflation (Jubb et al., 2017), it is vitally important to raise awareness and usage of high-quality, cost-effective, equitable open-access journals such as JOSS.

Future improvements to JOSS could include more structured metadata. Author affiliations are listed in the paper, but not in the metadata. They could be encoded using the Research Organization Registry (ROR) IDs. Similarly, funders are currently optionally listed in acknowledgements in JOSS papers, but these could be encoded using the Open Funder Registry, which will be merging with ROR in 2025. If the metadata submitted to Crossref included ROR IDs, future research on the institutional affiliations and research funding behind JOSS papers would be easier.

A final area of work is scalability of the "JOSS model" and its transferability to other disciplines. Within JOSS, 401 papers were published in 2023, and 267 in the first six months of 2024. One could study what limits the potential growth of JOSS (e.g, number of editors? cost? central functions?) and how these limits could be overcome. Similarly, JOSS's administrative infrastructure (to manage submission, reviews, etc.) is currently also used by the *Journal of Open Source Education* (JOSE) and the *Open Journal of Astronomy*, as well as for the

proceedings of the JuliaCon conference, and for selected papers from Euro-Par (specifically, papers that focus on new reusable software). What, if anything, limits broader adoption of the JOSS model across other academic publication venues? An obvious potential limitation to further transferability of this specific model is that it presumes comfort and familiarity with GitHub as a platform, which is not generally shared across all of academia. Thus, while the general paradigm is broadly transferable, the specific platform technology may need to change depending on the author population and audience. In addition, while we believe that the conversational review style (and accessibility of full review to readers both during review and after publication) utilized by JOSS can and should be widely adopted, we do recognize that, as extensively discussed in prior literature and referenced above, there can be downsides to fully non-blind (i.e., open) review and this choice might not be appropriate in every context.

Overall, we believe that JOSS serves as a model for the academic community, demonstrating the sustainability and scalability of a low-cost, diamond open-access, fully open-review publishing model with the potential for much wider adoption in full alignment with the UNESCO Recommendation on Open Science (UNESCO, 2021).

ACKNOWLEDGMENTS

This work was supported by the U.S. Department of Energy through the Los Alamos National Laboratory. Los Alamos National Laboratory is operated by Triad National Security, LLC, for the National Nuclear Security Administration of the U.S. Department of Energy (Contract No. 89233218CNA000001). It was also supported by the National Center for Supercomputing Applications, University of Illinois Urbana-Champaign. It was approved for publication by Los Alamos National Laboratory (LA-UR-24-28037 Version 2).
Data availability: Code and data supporting the observations in this paper are available from https://github.com/csoneson/joss-jlsc-2024.
Conflicts of interest disclosures: Patrick Diehl, Charlotte Soneson, and Rachel C. Kurchin are associate editors for JOSS. Ross Mounce is an employee of Arcadia, a family charitable foundation. Arcadia is a funder of OpenAlex. He is also a signatory to the Cost of Knowledge protest. He has previously volunteered to review for JOSS. Daniel S. Katz is a co-founder and associate editor-in-chief of JOSS. He has also been a reviewer for SoftwareX.

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