



## Research Output Tracking

### ORFG Community Survey Findings

19 September 2022

## Overview

In June of this year, as part of the efforts of the ORFG's Compliance & Output Tracking Working Group, we published an [open letter](#) – a [call to action](#) for interested parties across the research ecosystem to engage, convene, and collaborate in service of better research output tracking. One of our goals with this call was to open up communication and create channels for diverse actors to share what they think should be done to improve research output tracking. As a first step in this process, we launched a short community survey. We shared this survey via ORFG's website, our Twitter account, and through targeted emails sent to relevant actors identified by our Working Group. The survey received responses from a variety of actors representing different perspectives within the ecosystem. What follows is a summary of our overall findings.

## Survey respondents

The survey received a total of 26 responses. Six respondents (23%) self-identified as software or tool developers; five (19%) as content (code, data, or preprint) repository providers; four (15%) as scholarly publishers; four (15%) as professional academics; and two (8%) as research funders. Five (19%) additional respondents indicated 'other' under primary profession or type of organization, and left varying answers such as 'foundational infrastructure', 'standards organization', and 'publishing association', among others. (See Fig. 1.)

While we did not explicitly ask this question, our knowledge of some of the respondents' work within the ecosystem also identifies them as multi-purpose organizations. For example, we had responses from professional societies who serve many roles, like setting community research standards, but in this case they self-identified as either research funders or scholarly publishers. As another example, we had responses from organizations who self-identified as either repository providers or tool developers, but who also function in certain capacities as open research advocacy or standard-setting organizations. Many respondents may play similar multifaceted roles. Considering this, there were likely more perspectives represented than just the raw numbers on professions or affiliations suggest.

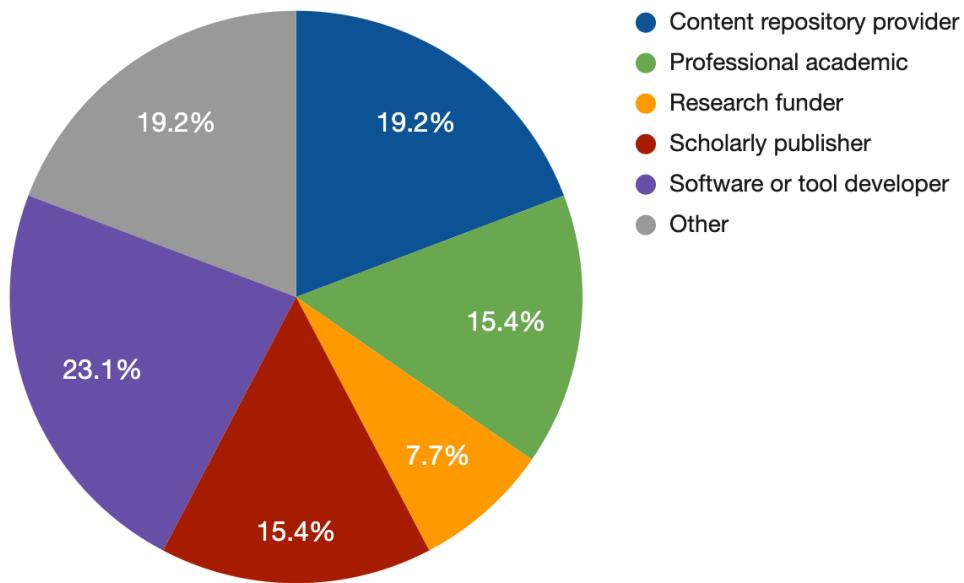


Fig. 1. Primary professions or type of organizations as self-identified by the 26 total respondents.

### **List of organizations / affiliations of respondents (in alphabetical order)**

What follows is a list of organizations or primary affiliations of respondents who filled out the survey (included with permission).

1. Altum, Inc.
2. American Philosophical Society
3. Center for Open Science
4. ChronosHub
5. Crossref
6. DataSeer
7. Digital Science
8. Dryad
9. Elsevier
10. Fluxx
11. Gordon and Betty Moore Foundation
12. Higher Education Sustainability Initiative
13. The Lens
14. National Information Standards Organization (NISO)
15. OASPA
16. OA.Works
17. PLOS
18. Royal Society of Chemistry
19. Springer Nature
20. Stichting OA Switchboard
21. University of Ottawa Heart Institute and Ottawa Hospital Research Institute

Two respondents did not list their affiliation, and three others declined to have theirs listed in this report, or did not respond to requests. It should be noted that, while in some cases respondents may have been authorized to speak on behalf of their organizations, others (e.g., university faculty members) expressed their personal opinions and not necessarily those of their employer.

## **Short-term actions to improve research output tracking**

The survey first asked: “*What is the most important action you think should be taken in the short-term (6 months to 1 year) to improve research output tracking? Which actors in the ecosystem would this involve and how?*”

A number of respondents (27%) highlighted digital object identifiers (DOIs) as a component of their answers. Some respondents suggested that one important action would be for funders to register DOIs for their grants. Our conversations with funders have revealed a strong interest in this; in fact, several ORFG members (e.g., James S. McDonnell Foundation, Moore Foundation, Templeton World Charity Foundation, Wellcome Trust) are already using grant DOIs for some funding programs. However, funders have expressed that assigning grant DOIs involves some technical challenges, constituting a barrier and limiting more widespread adoption. Five (19%) respondents identified Crossref as an important actor here. Crossref, through its own initiatives (see '[Registering research grants](#)'), as well as communications with the ORFG, has indicated willingness to work with funders to make this process easier. This warrants further discussion in the run-up to, and at, the community meeting.

Respondents (15%) also called for the use of persistent identifiers (PIDs) “across a broader range of research outputs” and “throughout the research lifecycle”. Importantly, a few respondents mentioned the need for education and training of researchers, funders, and institutions on DOIs/PIDs and their use. Another type of PID mentioned by respondents (15%) is one used for authors rather than outputs, specifically ORCID. Respondents suggested encouraging or requiring ORCIDs, and making it easier for authors to update profiles. Finally, two respondents suggested use of ROR (Research Organization Registry) IDs, a newer PID used to uniquely identify research organizations and help with improved affiliation data.

Seven (27%) respondents mentioned ‘metadata’, and some specifically said it was important to have PIDs and especially funding information included in metadata on publications and other research outputs. One respondent wrote, “Back-of-the-envelope calculations suggest that in 2017, only 1% of Crossref DOIs had funding metadata, but in 2021 17% did. At the current rate, it would take an unacceptably long time for that to reach 100%”. They suggested one strategy to increase the rate of change could be to look at publishers who are currently leading in this area, and analyze these cases to understand what has been “driving the progress we have already seen”. Several respondents wrote about the need for metadata to be open and machine-readable. Two (8%) respondents also mentioned the FAIR Principles, which, among other characteristics, have a strong focus on metadata. Recommendations by respondents to focus on metadata, with funding information and PIDs included, align well with [new policy guidance](#) from the White House Office of Science and Technology Policy (OSTP).

There were also calls by respondents for shared discussions and collaborations between various actors. One respondent suggested the formation of a “pilot consortium consisting of at least one of each of the following categories: Research funder, Academic Institution, and Journal Publisher” because they “represent the key incentives of academic research culture:

getting funded, hired, and published”, and they “believe that ORFG is well positioned to form such a consortium”. Respondents also mentioned other actors, such as authors, grantees/researchers, content aggregators, software providers, university program offices, and vendor systems. Bringing these actors together, and providing opportunities for them to learn from one another and devise collaborative action plans, is a major goal of this ORFG initiative.

Overall, publishers were the second most frequently mentioned actor (50% of respondents), just behind funders (54%). Respondents suggested that publishers could enable checks or otherwise capture / measure outputs (code, data, preprints, protocols) associated with published articles – taking advantage of articles as a central product which may be easier to track. Other suggestions included publishers: (1) adding “a specific entry field upon paper submission to enter funding details, including grant DOIs”; (2) “adding ROR IDs into their publication metadata”; (3) capturing additional identifiers and metadata, and ensuring “these can be exported (inter-operability)”; and (4) enacting policies, like requiring ORCIDs for authors. The ORFG is eager to discuss these ideas with publishers, and learn from those already doing them.

## **Recommended actions by funders and/or the ORFG**

The survey then asked: *“What do you think funders and/or the ORFG should do to improve research output tracking?”*

Many responses to this question (25 in total) were similar to the first, but with steps funders could take to operationalize or support these actions. Five (20%) respondents suggested funders register their grants using DOIs, and one pointed to [this guidance](#) from Crossref. Respondents also said funders should require DOIs, or PIDs more generally (16%), on all research outputs included, for example, in grant applications, renewals, and data management plans. One respondent recommended funding “PID education efforts”. Four (16%) respondents mentioned metadata, with suggestions such as: (1) “Requiring specific metadata fields or formats is best done through a repository run by the funder”; (2) funding preprint servers to improve their funding metadata, saying “That matters, as preprints are easily linked to their peer-reviewed equivalents, which allows funding metadata to be shared”; and (3) working with publishers to make funding metadata more accessible. Two (8%) respondents said funders should require use of ORCID. Two others said funders should “advocate for” FAIR principles, or that they should be “incorporated into grantmaking practices”.

As can be noted above, several recommendations refer to establishing funder policies – using words like ‘require’ and ‘mandate’ (e.g., require DOIs, mandate ORCIDs) – that could influence grantee practices. Additional responses related to policy included: (1) “require grantees use consistent funder acknowledgements”; (2) “Implement policies for grantees to report back on the outputs of their grants”; and (3) “Include sharing/consideration of more diverse research outputs in grant review and reporting processes and committees”.

At least 10 (40%) respondents recommended that funders make strategic investments to improve research output tracking. The most common suggestion was to fund scholarly

infrastructure, including “trusted repositories” to “ensure long-term preservation and access”. Some respondents emphasized the importance of such infrastructure being open, “community-developed”, and non-profit. One respondent suggested that funders host their own repositories (which would involve investment), saying this “would be the best way to make sure funder statements are included, metadata is machine readable, and persistent identifiers, for both objects and authors, are used”. Another respondent suggested a fund could be established for service providers that can aid in research output tracking by checking if outputs associated with articles (code, data, etc.) are available. One respondent recommended funding preprint servers, saying “they’re open, and often small enough that funders supporting them could significantly improve their operations”. Additional responses included: (1) “dedicate some resources to assessing research outputs and compliance with policies on sharing research outputs”; (2) “fund editorial management systems to add PID support”; and (3) “fund work through Scientific Unions and other bodies to develop reporting standards for data”.

There were several calls for funders to take collaborative action. One respondent said “an important asset of ORFG is its ability to convene multiple funding agencies” and suggested we put together “a joint statement or call for more attention on research output identification and sharing from publishers”. Another asked for funders to work together, considering that grantees are often funded by multiple organizations, to coordinate messaging on defining relevant research outputs and the value of sharing. A similar response – related to the call above to form a consortium between funders, institutions, and publishers – also asked for coordinated messaging. There were also suggestions for funders to work with publishers on things like workflows that would allow for compliance checking, standardizing funder acknowledgement sections, and opening up metadata. Related to this last point, one respondent suggested conducting “a large-scale text & data mining effort to liberate data on funding from Open Access works”. Other recommended actions (presumably for the ORFG, though this was not always specified) included: (1) “Host diverse meetings to connect the community and raise awareness of the issues”; (2) “Highlight success stories of stakeholders making progress in tracking diverse outputs”; and (3) “lead by example” by opening up grant data.

## **Actions by respondents or their organizations**

The next survey question asked, *“What could you or your organization do to improve research output tracking?”*

Responses to this question (24 in total) were varied, with some preferring to defer to future conversations to discuss specifics, while others gave details about the functionality their tools or services currently provide. Overall, there was a willingness to engage with us and talk further, and one respondent identified working together more “collegially/collaboratively” with other actors as one step they could take. Several others mentioned cross-sector and community-building efforts currently in place or planned. These efforts could be discussed in more detail at our community meeting, and potential ‘cross-pollination’ explored.

Actions suggested by some respondents pertained to contributing their ‘piece of the puzzle’ to interest areas (e.g., PIDs) emphasized under the previous questions. For example, one funder said they are already assigning DOIs to grants and financing initiatives to make this easier, while software/tool developers said they are working to support funders in issuing grant DOIs. Some developer groups have reached out to specific funders to pilot tools, or even created funder interest groups to facilitate reciprocal communication. However, there may be further opportunities to strengthen connections, or foment new ones. The following example illustrates both the need and desire for more communication: One funder suggested they could increase their capacity by hiring someone specifically dedicated to research output tracking, while a software/tool developer said they are struggling to find these “right people in the organization that are focused on research impact, outcome tracking, and portfolio analysis and engage with them”. We hope efforts like our planned community meeting can help to bridge gaps like these.

Some responses from professional academics were especially informative in providing ideas for what institutions might do to improve research output tracking. These included a suggestion that “Institutions could educate their community and create discussions in their communities about what aspects of research ought to be tracked”, which may be especially important to align with disciplinary norms regarding which outputs are the most relevant. Another respondent recommended that institutions should “Explicitly value these activities in tenure & promotion and at the provost level, while also providing funding for faculty AND professional staff to fulfill these functions”. These proposed actions align well with the activities and emerging working groups within the ORFG-led Higher Education Leadership Initiative for Open Scholarship ([HELIOS](#)), and present exciting opportunities for additional cross-sector alignment.

## Interest in a convening

We see our open letter and community survey as first steps in the process of bringing actors in this space together to work towards better research output tracking. In this spirit, we asked survey respondents whether they would be interested in participating in a future convening on this subject. An overwhelming 22 of 26 (85%) respondents answered ‘yes’, and 2 (8%) said ‘maybe’; 24 (92%) respondents left their names and emails to be contacted about future events. We will be contacting these respondents to arrange a first online community call during September of this year, and then scheduling subsequent meetings according to both participant interest and planned actions. An in-person convening could also be considered for 2023.



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