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An Open Peer Review Module for Open Access Repositories

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Session Type (select one)

- Panel
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Abstract

We present the first open peer review module for open access repositories. The module, designed in this first stage for integration with DSpace repositories, enables any scholar to offer a qualitative and quantitative evaluation of any research object hosted in a compliant repository. Weighted reputation metrics are calculated for individual articles, reviews, authors and reviewers. An advanced search function allows repository users to filter or sort research objects based on their reputation or the number of positive reviews. The integration of peer review in repositories promotes open scholarship by enabling a direct and transparent collaboration between authors and reviewers, and produces novel metrics directly reflecting the perceived quality of a research work by expert peers, contrary to current available metrics that only



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indirectly account for quality through usage statistics. The open peer review module has already been installed in two major Spanish repositories (DIGITAL.CSIC, e-IEO) with promising initial results.

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- Exploring Metrics, Assessment, and Impact
- Managing Rights
- Developing and Training Staff

Keywords

Open Peer Review, Metrics, Reputation, DSpace, DIGITAL.CSIC, e-IEO

Audience

Repository managers, developers, librarians, researchers.

Background

Research productivity is increasing at an unprecedented rate. Technological innovations, a surge in available computing power, and the ease with which digital information is stored and communicated is helping researchers to cross experimentation boundaries, to increase data availability, and to facilitate the transfer of knowledge. As a result, traditional research is being transformed into a dynamic and globally interconnected effort where ideas, tools and results can be made instantly accessible to the entire academic community. Institutional and multidisciplinary open access repositories play a crucial role in this emerging landscape by enabling immediate accessibility to all kinds of research output.

One important element still missing from open access repositories, however, is a quantitative assessment of the hosted research items that will facilitate the process of selecting the most relevant and distinguished content. Common currently available metrics, such as number of visits and downloads, do not reflect the quality of a research work, which can only be assessed directly by peers offering their expert opinion together with quantitative ratings based on specific criteria.



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To address this issue we developed an Open Peer Review Module (OPRM) to be installed on existing open access repositories and offered as an overlay service. Any digital research work hosted in a compliant repository can then be evaluated by an unlimited number of peers who offer not only a qualitative assessment in the form of text, but also quantitative measures that are used to build the reputation of the research work and its authors. Crucially, this evaluation system is open and transparent. By open we mean that the full text of the peer reviews are publicly available along with the original research work. By transparent we mean that the identity of the reviewers is disclosed to the authors and to the public. In our model, openness and transparency are two elemental aspects we consider necessary to address the issue of biased or non-expert opinions, which is inherent in the anonymous peer review model, characterized by the unaccountability of reviewers.

Importantly, our open peer review module includes a reviewer reputation system based on the assessment of reviews themselves by other peer reviewers. This allows a sophisticated scaling of the importance of each review on the overall assessment of a research work, based on the reputation of the reviewer.

The implementation of a peer review layer on top of institutional repositories could have the potential to transform the current academic publication landscape by introducing new scholarly workflows where a research item can be openly evaluated by the world's experts right at the institutional repository of its authors, before being submitted to an academic journal. This workflow challenges the current practices of peer review research evaluation. In most cases, journals, acting as brands in a competitive market, foster academic competition for a limited number of publication slots, instead of promoting open scholarship and collaboration. The integration of peer review in repositories will enable direct and transparent academic collaboration between authors and reviewers. In addition, the use of the OPRM will produce novel metrics directly reflecting the perceived quality of a research work by expert peers, contrary to current available altmetrics that only indirectly account for quality through usage statistics.

Presentation content

In this presentation we will explain how the existing infrastructure of open access repositories can be enhanced to bring a significant change in the current scholarly communication model where the evaluation of researchers and their works solely depend on academic journals. After a brief theoretical discussion of the issues addressed by the implementation of OPRM in repositories, we will present some technical aspects of the module and provide a demonstration



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of its use with real cases in two Spanish repositories where the OPRM has been already implemented (DIGITAL.CSIC and e-IEO). We will subsequently discuss the innovative reputation metrics derived from the use of the module and how they better account for research quality compared to currently available citation metrics and usage statistics.

2.1 The Open Peer Review Module

The module allows an unlimited number of expert reviewers to provide an evaluation for any research work, either preprint or already published. Reviewers can either be invited through the system (for example following the request by an author or editor) or can volunteer to review any object of the repository. In both cases, reviewers receive the review request details by email and are asked to offer their review reports within a specified deadline. The review and reviewer credentials are submitted to the system administrator for inspection and verification. After this process is completed, the review is linked to the original research object and becomes openly accessible.

By volunteering, any researcher can become a reviewer in the system whether affiliated to the repository's institute or not. The system will allow all interested peers to submit a review after creating a reviewer account and providing credentials certifying their qualification as peers. In addition to reviewing research objects, reviewers will be asked by the system to also evaluate previous reviews of each object they review.

Technically, the implementation was carried out on two major Spanish repositories, Digital-CSIC (JSPUI DSpace v4.3 + CRIS) and e-IEO (DSpace XMLUI v5) taking into consideration that both repositories have advanced author's data-models. Invitation and Review Modules have been developed as an extension of the workflow and submission capabilities of Dspace. Important to notice, the reputation algorithms were developed as separate plugins, allowing to easily adapt to other reputation models. Therefore, we believe that its implementation and functional adaptation to other repositories is feasible.

2.2 The reputations assessment model

The reputation assessment model is based on peers evaluating (quantitatively, in addition to qualitatively) each other's research works as well as each other's reviews. The latter allows for a sophisticated scaling of the importance of each review on the overall assessment of a research work, based on the reputation of the reviewer. We note that our model assumes that evaluations may be done on a number of dimensions (e.g. originality, technical soundness, predicted impact, etc.), however, an 'overall quality' dimension is needed for computing the general reputation of



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the research work. This is because aggregating the reputation for all dimensions into a single index may depend on a number of issues that are outside the scope of this work [1,2].

In brief, the model quantifies a reputation for articles (can be any research object hosted by the repository), authors, reviewers, and reviews. The reputation of an article is the weighted aggregation of the reviews it receives, where the weight depends on the reputation of the reviewer (discussed below). A single metric is provided for each evaluation dimension: overall quality, expected impact in the field, expected impact for society, etc. A scholar's reputation as an author is an aggregation of the reputation of their papers. Again, this reputation is computed for each dimension separately. The reputation of a reviewer is essentially a weighted aggregation of the judgements over her reviews by other reviewers who evaluated the same research works. The weight in this case is the reputation of reviewers who offer an opinion. Finally, the reputation of a review is similar to the one for articles, but using judgements instead of reviews.

Conclusion

Open Access repositories can play a far more significant role in scholarly communication by integrating an open and transparent evaluation system offered as an overlay service. This additional functionality can help to address many of the issues related to the current journal-based research reputation system, as well as to offer scholars further incentives to upload their research results into institutional repositories in order to be openly discussed and evaluated by expert peers. We have developed and presented here the first Open Peer Review Module for repositories using DSpace, which can also be easily adapted for use with other software packages. Importantly, the module introduces a novel reputation model that significantly improves the quality assessment of individual research works and their authors.

References

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