OPRM: An Open Peer Review Module for integration with OA repositories

Concept and Objectives

Rationale

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 like zenodo.org 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 product, which can only be assessed directly by peers offering their expert opinion together with quantitative ratings based on specific criteria.

To address this issue we plan to develop an open peer review module that could be installed to existing institutional or other repositories and offered as an overlay service. Digital research works hosted in these repositories could then be evaluated by an unlimited number of peers that would offer not only a qualitative assessment in the form of text, but also quantitative measures that will be used to build the work's reputation. Importantly, this evaluation system will be open and transparent. By *open* we mean that the full text of the peer reviews will be publicly available along with the original research work. By *transparent* we mean that the identity of the reviewers will be 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.

Crucially, our open peer review module will also include a reviewer reputation system based on the assessment of reviews themselves, both by the community of users and by other peer reviewers. This will allow a sophisticated scaling of the importance of each review on the overall assessment of a research work, based on the reputation of the reviewer.

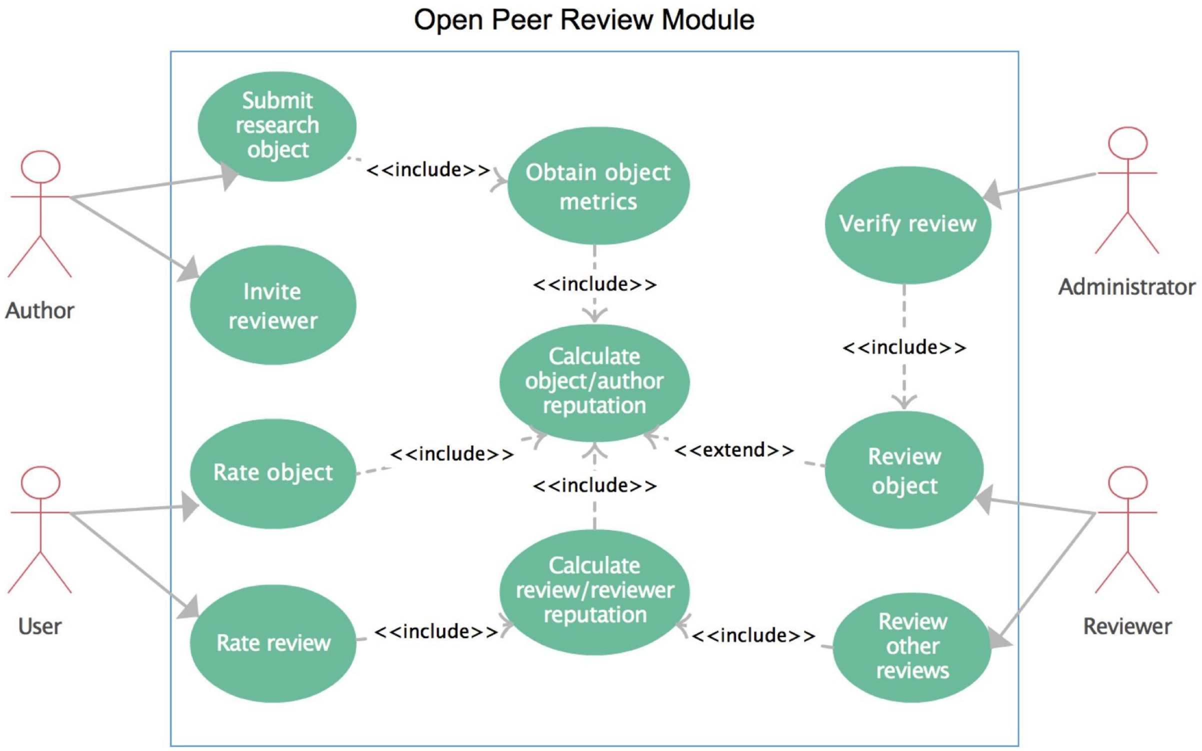
In summary, the central idea of our proposal is to capitalise on the existing infrastructure offered by open access repositories and take the necessary steps to convert them into functional evaluation platforms. This can be accomplished by the addition of an overlay peer review service that will allow expert scholars to provide qualitative and quantitative evaluations for all published and unpublished research works. This complementary evaluation process that can run in parallel to traditional journal peer review will:

- enable the peer review of any research work deposited in a repository, including data, code and monographs
- provide novel metrics for the quantitative assessment of research quality
- create a sophisticated reputation system for reviewers

- allow the weighting of reviews based on the quality of previous reviewer contributions
- facilitate the selection of relevant content from digital repositories by distinguishing material that has been validated by reviewers using tags and advanced search filters
- engage the research community in an open and transparent dialogue over the soundness and usefulness of research material

Use cases and usage scenario

The following diagram shows a schematic representation of the most important use cases included in the open peer review module. The module will consider different channels whereby reviewers will be able to send their reviews depending on whether they are institutional users or external peers. This development will avoid the risk of developing a prototype that is heavily reliant on institutional, endogamic reviews only, as the goal of the project is to set up the most widest and participatory open peer review service for repositories as technology allows.


Open Peer Review Module
Submit research object
<<include>>
Obtain object metrics
Verify review
Administrator
Author
Invite reviewer
<<include>>
<<include>>
Calculate object/author reputation
Rate object
<<include>>
<<extend>>
Review object
<<include>>
User
Reviewer
Calculate review/reviewer reputation
Rate review
<<include>>
<<include>>
Review other reviews

The **author** of any research work (research object) hosted on the repository can invite an unlimited number of expert reviewers to provide an evaluation of the object. Reviewers will receive an invitation by email and will be asked to offer their reports within a specified deadline. Reviewers with no prior reputation on the system should disclose their affiliation and provide at least one reference of a published article on a related matter. The review and reviewer credentials will be submitted to the system administrator for inspection and verification. After this process, the review will be linked to the original research object and become openly accessible.

Any expert peer 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.

Another important actor in the system are **users** that are registered in the repository, but do not necessarily qualify as peers or do not wish to submit a formal review for a given research object. These users will nevertheless have the option to comment on any research object and provide a rating/vote. Users will also be able to comment and rate reviews of research objects in a similar manner.

The **reputation of a research object** will be calculated by aggregating:

i. metrics already available in the system, such as visits and downloads
ii. weighted ratings by reviewers and users, which will be generated by the open peer review module

The reputation of research objects will then be used to calculate the **reputation of individual authors**

The **reputation of reviews** will be calculated by aggregating the evaluations of other reviewers and the ratings by users. They will subsequently be used to calculate the **reputation of individual reviewers.** If a person plays more than one role (author, reviewer and/or single user) in the system, the module will estimate **a global reputation** for this person, combining his reputation as an author and reviewer.

Methodology

The work proposed here will be delivered by a consortium of six partners:

i. Open Scholar CIC (OS) — An open organization of research scholars
ii. DIGITAL.CSIC — The Institutional Repository of the Spanish National Research Council
iii. e-IEO — The Repository of the Spanish Oceanographic Institute
iv. ARVO — A company of DSpace professional development and services
v. IIIA — The Artificial Intelligence Research Institute
vi. SECABA — A multidisciplinary laboratory of Library and Computer Sciences

ARVO will develop the open peer review module, **IIIA** and **SECABA** the reputation assessment algorithms, **DIGITAL.CSIC** and **e-IEO** will assist the integration of the module to the repositories and organize the beta launch event, and **OS** will be responsible for the overall coordination and supervision of the project and for all related dissemination activities.

Development of the Open Peer Review (OPR) Module

The technical development of the OPR module can be separated into two workpackages, the frontend and the backend development. The **frontend** includes the configuration, adaptation and development of new elements for the DSpace graphical interface. A non-exhaustive list of new elements includes: review requests, review forms, workflow adaptation, new design elements on the research object screen (reviews, user ratings, user comments, etc), modification of system roles and permissions, etc. The final deliverable of this workpackage will consist in the code for the invitation and review subsystems, the crosswalk OAI code necessary for making reviews retrievable, and complete instructions for installation and configuration. The **backend** mainly concerns the development of the reputation assessment system. New elements will be based on the models used by DSpace for the description of authors and objects performing all the necessary extensions to accommodate new functionalities. Importantly, reputation assessment functions will be built as a plugin invoked by the frontend interface, which will enable their use by other DSpace modules and by external systems. These two main workpackages will be complemented by specific integration tasks and tests, resulting in the installation and demonstration in the DIGITAL.CSIC repository, and the packaging with full documentation of the end product for its reuse by other repositories. What follows is a description of how specific challenges in the development process will be addressed.

Frontend

Invitations subsystem. The system will allow the author to send review requests to select peers. The submission-item-interface will be extended to specify the email addresses of the proposed reviewers. The system will send a customised email including a token that grants to the reviewer (normally external and without credentials into the repository) access to the research object and to the reviews subsystem. This subsystem will adapt and extend the request-copy function of DSpace, being its main function to enable owners of the token the required access to the repository.

Reviews subsystem. The reviewer will access the reviews subsystem acting with sufficient privileges granted by the token. In the first dialog, the reviewer will upload a publication (in pdf format) to the system that will solely be used for his/her qualification as peer. The evaluation forms are then presented to the reviewer, together with relevant terms and conditions regarding the whole review process. The proposed forms can be configured using standard data types, although some value-checking capabilities will have to be added. During this step the reviewer will also be asked to choose among a series of Creative Commons licenses while being advised to prefer the most permissive CC–BY 4.0 license. When the review form is completed, a new object is created in the submission workflow. The submission-item-interface already available in DSpace will be used to support this step, covering metadata declaration and attaching license attributions, although some minor modifications will be included to ease and complement this interface. The submission workflow will then assign the review object to the repository administrators, with a single Accept/Reject/Edit Metadata Step. The administrator can complete the deposit process with any necessary metadata enrichment. Ending this step, specific background tasks will be attached to the process, via consumer-events, to perform automatic validation of the metadata, linking reviews and reviewed objects, and most important, calling the reputation submodules to calculate new values (for authors and research objects) and automatically incorporate them into the reviewed object and into the review.

Interoperability. Review objects along with all their accompanying metadata can be exposed via standard interoperability mechanisms as REST services or OAI-PMH, considering the same restrictions and limitations as other research objects. If the descriptive metadata used for reviews is not dublin-core, we will develop the specific OAI-PMH interface crosswalk to expose that metadata to facilitate its harvesting by openaire.eu. The review objects can also be deposited in other repositories like zenodo.org using the API programmatic interfaces exposed by this repository. In order to demonstrate the concept, we plan to integrate the final step of the deposit process with the archiving of reviews in a specific collection on sandbox.zenodo.org

Backend

Author and object data models. The object data model will be extended to incorporate relevant metrics as well as the back-and-forth relations between research objects and their reviews. An extension of the qualified-dublin-core metadata scheme could be used, leading to simpler implementations in DSpace installations, although the use of specific schemas to manage these data will also be considered.

Digital object's reputation submodule. This submodule bundles the functions to invoke, calculate and retrieve a digital object's reputation. Since the submodule can be used potentially in different scenarios, we will build it as a library of functions. This submodule shall expose in its interface the functions to obtain information of the digital object and its reviews, calculate reputation based on the submitted parameters and update the reputation with the new calculated values. In order to maximize its evolution and reuse across platforms, this submodule will be released as an independent plugin (in DSpace terminology), facilitating the installation and deployment process and even its substitution by any other set of algorithms. Its services could be exposed with basic wrapping, extending the actual DSpace REST-interface, thus allowing the invocation by other repository systems.

Author/reviewer reputation submodule. This submodule will expose the functions of obtaining reputation information from objects, including reviews, calculate the author's reputation and update the reputation with the new calculated values. Similarly to the aforementioned submodule, this submodule will be released as an independent plugin.

Module integration. In order to integrate the OPR module into the DIGITAL.CSIC repository, the following tasks need be accomplished:

- Define new collections to store the reviews
- Define access points to invitations subsystem
- Define new workflows for the reviews subsystem
- Modify the authors' data model in DSpace-CRIS
- Modify the object data model

OPR Module release

All the code generated in this project will become available in public code repositories (github), documented and made configurable enough so that others can change it to match their own configurations, and following accepted best-practices regarding code contributions to open source projects. We strongly advocate to release the code under the same license as the DSpace general code, a BSD License, explained here: http://owl.li/NPB6V. Important to note, the code will not include third-party software, libraries or code dependencies not compatibles with these licenses.

Reputation assessment model

The complex issue of creating reliable reputation metrics for research works, authors, reviews and reviewers will be tackled by the combined expertise of two prominent research groups with ample experience in opinion-based reputation modelling (IIIA) and group decision making with non-homogeneous experts (SECABA).

Both approaches of reputation assessment, a) as a probabilistic modelling of opinions, and b) as group decision making, consider that the peer reviewers do not have the same confidence and expertise in the topic they offer their opinion on. The aggregation process of reviews must therefore take into account these heterogeneous situations and larger expertise must weigh more in the global aggregation. The reputation assessment model will thus be based on the concept that the reputation of the opinion source impacts the reliability of the opinion itself. In addition, the model will be flexible with its opinion sources: it will use both explicit opinions (offered by peers in the form of formal reviews) and implicit opinions that can be extracted from user behaviour (such as indirect quality indicators codified in the number of visits and downloads), in situations where explicit opinions are sparse. This will partly address the cold-start issue until expert reviews start accumulating in the system.

Furthermore, our reputation model will include consensus measures to further strengthen the validity of aggregation outcomes. This means that greater consensus on the evaluation of a research work will count positively for the reputation of this work —five reviewers agreeing a paper is “good” is different than two saying its “poor”, two “excellent” and one that is “good” despite that the aggregated average is the same. Algorithms, measures and techniques developed for consensus assessment that will be implemented in our reputation model are described in detail in [11,12]. What follows is a discussion of how the model proposes to address common theoretical questions in the reputation assessment of research works, authors, reviews and reviewers.

The reputation of research works. This will essentially be a weighted aggregation of the opinions it has received. This weighted aggregation is designed in such a way that takes into consideration the reliability of those opinions, which we present below as the reputation of reviews. The reputation model will be specifically designed for the purpose of this project, but will be grounded on ideas and results from previous research [e.g., 6,7,9,10].

The reputation of authors. The reputation of an author will essentially be the aggregation of the reputation of his or her research works. This aggregation process will be determined by its “reliability parameter”, which is a measure that depends on several factors, such as the number of opinions the research work has received. The technical details of the above proposal for calculating the reputation of authors have already been presented in [10] and evaluated in [11].

The reputation of reviews. Just like research works, reviews will also receive opinions by other peer reviewers and by the users of the system. Their reputation will be calculated by taking the following into consideration:

- If no opinions are available, then the default reputation is based on the subjective perception of the reviewer regarding his or her expertise/confidence.
- As opinions become available, the reputation of a review becomes a weighted aggregation of these opinions, where the weighting takes into consideration the reliability of the opinions, inherited from the reputation of their source.

Previous research of the IIIA group provides specific approaches for aggregating opinions [9], whereas [3,6,7,10] provide information on assessing the reliability parameter.

The reputation of reviewers. We consider that a reviewer’s default reputation when his/her reviews have not received any opinions yet is his/her reputation as an author in this field. However, if the reviewer’s reviews have already received some opinions, then the reviewer’s reputation becomes an aggregation of the reputation of the reviews. Again, this aggregation is based on the concept that the influence of each review is determined by its “reliability parameter”, which is a measure that depends on several factors, such as the number of opinions the review has received. Again, [9] provides our approaches for aggregating opinions, whereas [3,6,7,10] provide detailed information on assessing the reliability parameter.

Integration and testing in two large institutional repositories

The open peer review module will be tested in two DSpace repositories, one running on JSPUI (DIGITAL.CSIC, on DSpace 4.x.x-CRIS at the end of June) and another on XMLUI (e-IEO, scheduled to be on version DSpace 5 early July). DSpace is widely used worldwide and its active community reinforces the potential of the wide application of the prototype. However, a main goal of the project is to build a prototype which can be easily used by the extensive community of open access repositories regardless of their software and thus the module and its workflow will be developed keeping in mind such diversity.

The institutional open access repository of the Spanish Institute of Oceanography, a public research organization with 10 research centres and 56 million euros annual budget, follows 2.0 DRIVER guidelines, the OAI-PMH protocol for transmission and retrieval of metadata (Dublin Core) and uses DSpace open source software and Creative Commons licenses. The repository currently hosts 7.943 research items (group presentations, articles, conference presentations, reports on campaigns and investigation projects, contributions to periodical reports, doctoral thesis, complete books and book chapters, learning materials, lectures, manuals, maps, oral recordings, images, datasets, animations, acoustical recordings), by 9.325 authors. The repository's administration is constantly working to include new implementations and functionalities to improve semantic and technical interoperability.

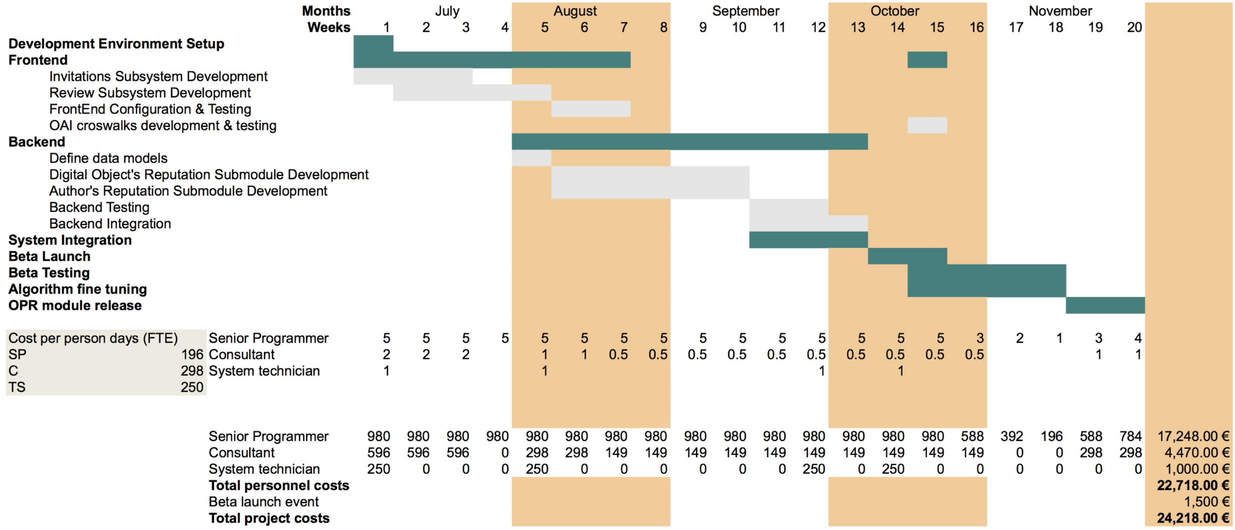
DIGITAL.CSIC is the largest institutional repository of a research performing organization in Spain —the Spanish National Research Council (CSIC)— and ranked in the 5th position of the European classification in the latest edition of Ranking Web of Repositories. The potential impact of this testing is high for a number of reasons, including the sheer volume and diversification of research outputs typologies available in the platform, its multidisciplinarity, and the repository's track record in enriching its infrastructure with value added services to measure research impact along traditional and emerging lines. In fact, with over 110,000 works DIGITAL.CSIC offers an ideal platform to test our prototype on a wide digital collection comprising publications, grey literature, datasets, software code, conference objects, working papers and reports, policy documents, theses, blog postings, preprint articles and many more. Further, such variety of research outputs spans across 8 broad scientific areas ranging from hard sciences to social sciences and humanities, which will allow to experiment with the emerging review approaches on very diverse disciplines and thus identify likely discipline-specific behavior and community patterns.

In addition, since 2011 DIGITAL.CSIC has developed home-grown modules to keep track of and aggregate usage and other statistics across CSIC research institutes, scientific areas, years of deposit, open access degree, typologies and authors and has enriched its contents with item-level data as far as citation counts, social web and altmetric indicators are concerned (for instance,http://digital.csic.es/handle/10261/115907). These value-added services are described in full detail here and are highly welcomed by the CSIC researcher community as they help put their research into a broader and more meaningful context. A natural step forward in this work agenda was the organization of the Seminar New systems for scientific evaluation, peer-review and open access during the last International Open Access Week edition as well as other like-minded activities that aim to engage the institutional community in an active debate about the need for a reform in the scholarly communication and scientific assessment systems. Thanks to these efforts, DIGITAL.CSIC is well placed to provide not only with a rich collection of scientific outcomes to test the open peer review prototype but also with a broad pool of researchers critical within the dominant system and willing to participate in an innovation project like this. Last but not least, interoperability with and wider visibility through OpenAIRE are most guaranteed as DIGITAL.CSIC ranks amongst its TOP10 data providers as far as ERC and FP7 projects publications are concerned.

The implementation of the open peer review module in DIGITAL.CSIC will allow for its installation at different levels, considering that the repository is in its final stage to migrate into an upgraded DSpace version, which will include researchers' profile pages and other new functionalities to support additional impact analysis and wide content reuse. The inclusion of DIGITAL.CSIC in this project is thus all the more timely as the peer review prototype will be tested on traditional artifacts like articles and conference objects but also on typologies that are experiencing a rapid upsurge like open data, software applications, policy documents and blog postings. Pre-publication and post-publication reviews will be encouraged inasmuch as less exhaustive albeit expert-driven feedback like comments and lay contributions, and CSIC authors from different disciplines will be invited to take part in the pilot project actively both as recipients of external reviews and potential reviewers.

Workplan and cost information

The chart below shows the programme of the work that will result in the main deliverable (the release of the OPR module), along with a breakdown of costs according to each project stage. Apart from the release of the module with documented code and API open licenses, other deliverables required by the tender will also be met on time as seen on the chart. Staff costs are broken down into the estimated number of days to be contributed to the project by each person/ percentage of FTE. We also calculate an additional cost for a beta launch event that will be held in one of the main headquarters of the Spanish National Research Council (CSIC) in Madrid. The event will be jointly organised by CSIC and Open Scholar and it will aim to target an audience of 150–200 researchers belonging to CSIC institutes across all research areas, as well as select Open Scholar members, the IEO scientific community, and other interested authors from the extensive network of universities and research centers in Madrid, who will be offered a detailed presentation of the prototype, and will be invited to participate in the beta testing phase providing feedback for the final fine-tuning of the module. A tentative budget of €1,500 is estimated to cover a coffee break during the event.



Months	July				August				September				October				November			
Weeks	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Development Environment Setup	■																			
Frontend	■	■	■	■	■	■	■								■					
Invitations Subsystem Development	▨	▨	▨																	
Review Subsystem Development		▨	▨	▨	▨															
FrontEnd Configuration & Testing						▨	▨													
OAI croswalks development & testing															▨					
Backend					■	■	■	■	■	■	■	■	■							
Define data models					▨															
Digital Object's Reputation Submodule Development						▨	▨	▨	▨	▨										
Author's Reputation Submodule Development						▨	▨	▨	▨	▨										
Backend Testing											▨	▨								
Backend Integration											▨	▨	▨							
System Integration											■	■	■							
Beta Launch														■	■					
Beta Testing															■	■	■	■		
Algorithm fine tuning															■	■	■	■		
OPR module release																			■	■

Cost per person days (FTE)			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		Senior Programmer	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3	2	1	3	4
SP	196	Consultant	2	2	2		1	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5			1	1
C	298	System technician	1				1							1		1						
TS	250																					

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Senior Programmer	980	980	980	980	980	980	980	980	980	980	980	980	980	980	980	588	392	196	588	784	17,248.00 €
Consultant	596	596	596	0	298	298	149	149	149	149	149	149	149	149	149	149	0	0	298	298	4,470.00 €
System technician	250	0	0	0	250	0	0	0	0	0	0	250	0	250	0	0	0	0	0	0	1,000.00 €
Total personnel costs																					**22,718.00 €**
Beta launch event																					1,500 €
Total project costs																					**24,218.00 €**

People and Experience

Pandelis Perakakis (OS) [https://pandelisperakakis.wordpress.com] has a PhD in clinical psychophysiology from the University of Granada (Spain). Currently he is head of communication and dissemination of the European project Psycris, supervising, among other activities, the project's alignment with European guidelines on open access. He has published papers on journal-independent open peer review models, ethics in scientific communication and evaluation, open access, journal bibliometric indices, and self-archiving policies and workflows. In 2012, he co-founded Open Scholar CIC that he currently serves as director. Open Scholar is an organisation of 120 volunteer research scholars from 17 different countries that actively promote an open model of scientific evaluation and dissemination. Apart from publications, blog articles and interviews, he has given lectures and workshops in numerous European countries where he had the chance to discuss his ideas for a new, open and collaborative system of scientific peer review.

Agnès Ponsati (DIGITAL.CSIC) has a degree in Hispanic Philology and a Diploma in Librarianship and Documentation from the University of Barcelona and since 1994 she has managed the CSIC Unit of Information Resources for Research, one of the most important scientific library networks in Spain. She also worked at the Technical Department of Barcelona's University Library and as automation manager at Catalonian CSIC libraries branch. Specialist in automated library systems in distributed networks and in management and coordination of library services and collections at research hybrid-digital libraries and responsible for setting up CSIC Virtual Library and the management of digital collections and all technological supporting tools. She is author of papers on technical management of online collective catalogues in distributed environments and management of library services in specialised libraries. With a wide expertise in licensing digital content, she has been member of several publishers' library advisory boards (ELSEVIER, SPRINGER, WILEY, IOP and BRILL) and currently serves at SCOAP3 Global Council representing the Spanish library consortia.

Isabel Bernal (DIGITAL.CSIC) holds a M.A. degree in Librarianship and Documentation from the Vatican Library School (Rome) and a M.A. degree in Economics and International Relations from the School of Advanced International Studies (SAIS) of the John Hopkins University (Washington, DC). Since January 2010 she has managed DIGITAL.CSIC with a focus on content development, traineeship, advocacy and outreach activities; new functionalities and value-added services for end-users; creation of partnerships at national and international levels; and institutional cooperation with like-minded initiatives. Her international work experience includes 5 years at EIFL where she coordinated projects related to enhanced access to scholarly e-resources through local library consortia in 48 developing and transition countries and the European Commission. She has authored various works on open access to research outputs, value-added services in repositories and linkage with information systems, access to scholarly resources through library consortia in developing and transition countries, ICT applications in libraries and museums.

Concha Mosquera de Arancibia (e-IEO) is a researcher at the Spanish Institute of Oceanography (IEO) where she has worked as scientific editor in charge of IEO's publications. She has a BA in Biology at Complutense University of Madrid (1976), and a Master's Degree in Journalism and Communication of Science, Technology and Environment at Carlos III University of Madrid (2005-2006). Since 1992, she is the Scientific Editor of the IEO. She has numerous publications as an author and an editor. In 2011, she launched the Institutional Digital Repository of the IEO on Open Access and has been coordinating it since then. She has taught courses and published several works about the repository, the last two in BIREDIAL (2013 and 2014).

Carles Sierra (IIIA) [http://www.iiia.csic.es/~sierra/] is currently vice-director of the Artificial Intelligence Research Institute and has been Head of the Intelligent Systems Department for five years. He has led around twenty projects to a successful end and has been the IIIA PI in several previous EU projects, one of which was LiquidPub, a project proposing a radical paradigm shift in the way scientific knowledge is created, evaluated, and maintained [1,2]. He has over 300 publications in his areas of research, with several top articles on trust and reputation [3,4,5,6,7,8,9].

Nardine Osman (IIIA) [http://www.iiia.csic.es/~nardine/] is a researcher at the Artificial Intelligence Research Institute (IIIA-CSIC), with a PhD (2008) in Informatics from the University of Edinburgh, UK. She has more than 30 publications in major international journals and conferences, with a total of roughly 200 citations**.** Trust and reputation is one of her areas of expertise [3,4,5,6,7], and one of her trust algorithms [5] is copyrighted and is being used in the industry. She has worked on several European projects, including LiquidPub, a project proposing a radical paradigm shift in the way scientific knowledge is created and evaluated [1,2].

Emilio Lorenzo (ARVO) has a degree in Communications Engineering (Universidad Politécnica de Madrid, 1983), a masters in e-commerce (Universitat Politècnica de Catalunya, 2001) and has been responsible of technological projects in consulting firms and public organisations. In 2007, he founded Arvo Consultores y Tecnología, a Registered DSpace Service Provider. The company is helping institutions to continuously improve their repositories and related research information infrastructures and provides a full range of repository services including installation, migration, training, customization and maintenance to a number of institutions in Spain, México, Colombia, Chile, Argentina, and Italy.

Enrique Herrera-Viedma (SECABA) [http://decsai.ugr.es/~viedma] has a PhD in Computer Science from the University of Granada (Spain). He has published more than 300 refereed journal and conference papers related with the areas of fuzzy decision making, computing with words, linguistic preference modelling, fuzzy information retrieval, recommender systems, Web quality, social media, digital libraries and bibliometrics. His H-index is 46 according to the Web of Sciences and 61 according to Google Scholar and many of his papers have been considered hot papers according to the ISI database Essential Science Indicators of Thomson Reuters. He is considered one of the Most Cited Scientists in Engineering in the ISI Web of Science Essential Science Indicators (situated at the top 1% of the most cited scientists in his field) and in 2014 he was included in the liist of Highly Cited Researchers in Engineering by Thomson Reuters.

Antonio G. Lopez-Herrera (SECABA) [http://sci2s.ugr.es/members#AGabriel] is associate professor at the Dept. of Computer Science and Artificial Intelligence and Vice-dean of Academic Affairs at the Faculty in Library Science School (University of Granada (UGR), Spain).

He received the Ph.D in Computer Science in 2006 and the master degree in Scientific Communications & Information in 2008. He is a researcher at the Secaba Lab (http://secaba.ugr.es/) and he has authorship more than 70 publications in international journals and conferences related with information access, including retrieval, filtering, recommending and quality evaluation, and related with bibliometrics and scienciometrics. He has expertise in developing scientific information systems and software, as the Spanish Index of Social Science Journals (http://ec3.ugr.es/in-recs/) or the Science Mapping Analysis Tool, SciMAT, (http://sci2s.ugr.es/scimat/).

Risk assessment

One of the most widespread criticisms of open peer review is that peers will be reluctant to submit negative reviews if their identity is disclosed. Although this criticism is not always supported by data, we acknowledge that our model can meet an initial hesitation on behalf of researchers to openly evaluate their colleagues. To manage this potential risk we will consider including an anonymous review option if our beta testing shows it's necessary. In this case the system will also allow anonymous evaluations that will, however, count less in the overall assessment of the research object. It is important to note that anonymous here refers only to the authors and the public, as system administrators will have access to all the information provided by the reviewer in the first stage of the review workflow.

Although in our prototype the reviews won't have a DOI they will all have a handle, which is also a URI and thus makes it possible to cite this research output, which provides additional motivation for reviewers. Worth noting that the repository does support a system of permanent identifiers.

On the technical side, it should be highlighted that the standard dublin-core schema used on the majority of harvesting integrations does not fit well with the complex data models of authors (using CERIF-XML data model) and research objects. Additional work, not included in our proposal, must be considered in the definition of metadata schemas, or at least some LOD wrapping, and interoperability protocols in order to expose reviews as associated or embedded objects linked to the main research object, exposing reputation scores for author and objects, etc.

It must be also noted that the variety of software versions and configurations existing in OA repositories results in additional complexity. For instance, there are several possible access points to the request-review functionality, ranging from author's pages to item's pages, and we will have to take into account this diversity in the solution design. Similarly, there are different criteria on the way repository managers grant access to deposit functions, with some methods that could be considered restrictive, which limits the creation and storing of reviewer credentials and ratings.

References

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