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OPERAS:
bringing the long tail of Social Sciences and Humanities into Open Science*

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Received: 14 September 2018; **Accepted:** 22 October 2018; **First Published:** 15 January 2019

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ABSTRACT

The paper will present OPERAS, a comprehensive infrastructure aimed at providing a pan-European infrastructure to rethink and reshape publishing, discovery and dissemination addressing the specificity and the critical issues of Social Sciences and Humanities (SSH).

The paper will try to set the scene examining the status of scholarly communication, the developments of Open Access and Open Science, and the specific demands for SSH. A second part will outline how OPERAS meets these needs, taking care of all the steps of the scholarly communication cycle.

OPERAS unique approach is to unite researchers, libraries and publishers in a common effort, in order to take back control over scholarly communication. Not merging nor replacing, but nurturing existing realities, OPERAS provides innovative services to bring SSH into Open Science.

OPERAS is designed to elaborate effective and scalable long-term strategies for the future development of the digital infrastructure and community building needed to innovate scholarly communication in the SSH. OPERAS pervading idea of science as communication holds an immense potential for an inspiring model of Open Science with direct societal impact, based on continuous communication.

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CITATION

* Il presente report non è stato sottoposto al processo di peer review e viene pubblicato dopo controllo e revisione redazionali.

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Science as communication

In the common perception of "scholarly communication", the publication is considered often as the last step, a sort of subsequent output and manifestation separated from research.

Science itself, however, could be conceived as a communication practice (Nielsen 2013), or, as Jean Claude Guédon (Guédon 2017) puts it, "communication is, indeed, the essence of science".

Moreover, if "publication […] is part of a continuous cycle of reading, writing, discussing, searching, investigating, presenting, submitting, and reviewing" (Borgman 2010) and if "No scholarly publication stands alone […]. Scholarship is an inherently social activity, involving a wide range of social interactions within a research community" (*Ibid*.), then, even the related infrastructure must be a hub of dynamic and interactive networks.

Instead of the current "scanned copy of the paper-based system" (Van de Sompel *et al*. 2004), scholarly communication deserves a framework of fluid, identifiable, machine readable elements (Van de Sompel and Lagoze 2009) and a distributed, decentralized system (Van de Sompel 2018).

As for the single building block, the "scholarly record", its boundaries are both expanding and blurring, evolving from a text-based, printed material to increasingly digital-born item which includes research data sets, computer models, interactive programs, complex visualizations, labnotebooks, and potentially any other materials that matter for a researcher. Beyond the traditional focus on published outcomes, like books and articles, the changing idea of "scholarly record" encompasses materials generated both in the process – methods, evidence, discussions – and in the aftermath – debates, revisions, reuse. The emergence of this more liquid and composed output also affects the traditional roles in its stakeholder ecosystem: creating, using, collecting and fixing the "scholarly record" become more blurred or interconnected, or simply played by different actors – authors, publishers, readers, librarians - than in the past (Lavoie *et al*. 2014).

It is different from the transition to print: "something very fundamental took place in the transition from manuscript to print: it is not simply a matter of substituting a copying technique by another, albeit more efficient. More deeply, the objects produced, the cultural values attached to them, and the relationships people maintain with these objects shift in a considerable way. The relationships between documents also shift, and, in the end, society reflects those transformations in its very economic and political structure. Our present transition into the digital age is at least as fundamental as that brought about by print" (Sterns and Guédon and Wiben Jensen 2015).

The digital age is nowadays becoming the age of Open Access and Open Science.

In this transition, the focus should not be on preserving the status quo or the current roles: "we could then examine how to preserve and even optimize them. We could imagine how to finance them by associating them with the kinds of objects and processes that best fulfill the needs of the "Great Conversation" of knowledge production. Doing so would also allow us to look at the present situation more critically […]. The task at hand is to start from the digital reality of documents and their management, and create the digital objects, tools and processes needed to enhance dialogue among researchers" (*Ibid*.). Skills and services must serve the "great conversation", and not the other way around (Guédon 2017).

The right perspective should be: what does scientific communication need to work at its best?

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State of the art

Setting the scene implies to contextualise the specificity of the Social Sciences and Humanities (SSH), broadening more and more the perspective to get to Open Science paradigms.

SSH and the scholarly communication system.

Social Sciences and the Humanities (SSH) have different communication practices and tools compared to Science, Technology, Engineering and Medicine (STEM). The choice of monographs or journal articles as prevalent medium not only is the most noticeable one, but it reveals other specificities in terms of episteme, workflow, collaboration, elaboration and construction of the argumentation (Eve 2014; Mounier 2017). Due to these differences, books appear to be also more challenging in adapting to the digital evolution, even at risk of extinction; changing technologies or media while sticking to the core functions of the books might ensure the vitality scholarly communication deserves (Fitzpatrick 2011).

In SSH, research and authorship are deeply connected and research and publication are linked through the editing process.

As singles, SSH researchers tend to be individualistic: co-authoring is rare.

As a community, SSH is fragmented across multiple disciplines and subdisciplines, as well as in small research units, and, of course, different languages. This might be one of the causes of the almost complete lack of databases and general discovery tools, as opposed to STEM.

Moreover, SSH research is often grounded in specific cultural or geographical areas, hence the persistence of native languages opposed to English as *lingua franca* in STEM. Multilingualism is still a clear trait which shapes publications in SSH despite a trend in internationalization, which often takes the form of "transnational regionalization" (Heilbron *et al*. 2017).

The fragmentation in disciplines and languages results in a fragmentation in the publishing landscape, with a huge number of small size players of different types and quality serving local scientific communities and specializing in narrow fields of research. Sometimes it also results in a lack of appropriate skills, know-how, adoption of common standards, and a scarce attitude towards collaboration and innovation; the quality of the outputs, therefore, varies widely (OPERAS 2017). Considering the situation of oligopoly characterizing the STEM publishing world, where five big publishers share the market (Larivière *et al*. 2015), the contrast to SSH could not be more marked, all the more so when referring to monographs.

This is not a flaw itself, it becomes a flaw "when the actors playing in the field operate as isolated beings, unaware of what others are doing, reinventing the wheel in their own corner or even competing through unfair practices. In such circumstances, fragmentation turns into disintegration and the scientific community which needs efficient partners to circulate ideas and research findings across borders could be negatively impacted. The flaw is also apparent when the whole system experiences a global change in which all players need to redefine and renew their mission, the services they deliver, and consequently their workflow, business model and tools. The global change experienced by everyone is well known: the digital turn and its consequence: Open Science" (Mounier 2017). Let's examine the latter.

SSH go digital: digital publishing and the Digital Humanities.

Defining Digital Humanities, Federico Meschini (Terras and Nyhan and Vanhoutte eds. 2016, 281) usually quotes Thomas Pinchon: "You know what a miracle is […] another world's intrusion into this one" (Pinchon 1965). It seems quite an appropriate image.

Going digital doesn't mean just "place material online" and it doesn't come labour-free or cost-free (Eve 2014); moreover, "digital humanities" cannot be mistaken with digital publishing.

Going digital means going through digital networks, so that interaction and connectivity must be taken into account when writing; the focus should then be on facilitating the process of scholarly work instead of concentrating on the single product (Fitzpatrick 2011).

"Digital Humanities" is a sort of umbrella term of such a comprehensive and complex phenomenon – encompassing both techniques e.g. encoding textual sources, geographic information systems, lexicometry, digitization of cultural, scientific and technical heritage, web cartography, datamining, 3D, oral archives, digital arts and hypermedia literatures, etc. and a different, more collaborative attitude. Finding a satisfying definition is not easy (Schreibman and Siemens and Unsworth eds. 2016). However, the Manifesto of Digital Humanities (2010) is useful in underlying some crucial features:

> 1. Society's digital turn changes and calls into question the conditions of knowledge production and distribution.
> 2. For us, the digital humanities concern the totality of the social sciences and humanities. The digital humanities are not tabula rasa. On the contrary, they rely on all the paradigms, savoir-faire and knowledge specific to these disciplines, while mobilizing the tools and unique perspectives enabled by digital technology.
> 3. The digital humanities designate a "transdiscipline", embodying all the methods, systems and heuristic perspectives linked to the digital within the fields of humanities and the social sciences.

Integrating all the potentiality of digital techniques into SSH is not just a matter of practice, it requires a cultural change also in education and training and know-how. To limit to the publishing field, the above mentioned "mobilization" has been inconstant and uneven among the players. Late in exploiting the potential of the web, due often to a chronic lack of funding, such a plethora of players goes from innovative ones to those still suspicious of the digital environment and thus still devoted to the paper format. Books, when tethered to old publishing practises, are subject to low visibility and thus they can't contribute to further knowledge creation, which is one of the purposes of the Manifesto (2010): "Our objectives are the advancement of knowledge, the improvement of research quality in our disciplines, the enrichment of knowledge and of collective patrimony, in the academic sphere and beyond it".

On the contrary, digital techniques, when properly applied, enable rethinking the most traditional SSH output, the book, to meet the needs of the digital readers: features like portability on different devices, quick navigation tools tailored for different readers, interactive tools, open and flexible files, actually bring the book into the digital age (Humphreys *et al.* 2018).

Being digital is not enough: successful researches rely on unrestricted access to high quality scientific outputs and cross-disciplinary, international collaboration fostered by Open Access to scientific research (OPERAS 2017).

Open Access and SSH.

Despite the well-known official definitions of Open Access (Berlin Declaration 2003; BOAI 2002; Bethesda 2003), let's stick for our purposes to the plain albeit powerful one by Jean Claude Guédon: "Open Access is simply a way to express the cross-fertilization of the very culture of science with new technologies to create the optimal communication system science needs" (Guédon 2017). Open Access is functional to the great conversation. It helps solving the paradox Glyn Moody (Moody 2016) stigmatizes: "All human knowledge is there – so why can't everybody access it?".

Under accusation is the current system of publishing, closed behind price and permission barriers (Suber 2012). When the content is closed, no one is allowed to read, explore, use, address societal challenges, or simply allow the rise of further questions.

"We are entrenched in systems that no longer serve our needs", as Fitzpatrick (Fitzpatrick 2011) puts it. On one side stands the "insupportable economic model" (*Ibid.*), a concept Guédon stresses: "In evaluating the various forms that Open Access can take, the health of the communication system of science must be considered and placed at its very centre. In observing the evolution of Open Access itself, the powerful effects of digital culture and of networks should also be at its centre. In no case should economic interests be allowed to interfere with the full potential of a free communicating system designed and destined to help humanity – the whole of humanity – grow knowledge. Unleashing the full power of the distributed system of human intelligence remains the fundamental objective. Open Access (*well-crafted* Open Access, that is) stands at its very heart" (Guédon 2017).

So, on the other side stand precisely these principles of openness and reuse, in order to booster knowledge creation.

Martin Eve thoroughly analyses the matching between Open Access and SSH practices, reporting also the debate and the oppositions arisen from different players (authors, commercial publishers, learned societies…) (Eve 2014).

Transition to Open Access is not straightforward, registering a 47% rate (Piwowar *et al.* 2018); on that basis, universal Open Access could be reached in 2040 (Priem 2018). Official claims by the European Council might be optimistic, foreseeing "immediate Open Access by default in 2020" (European Council 2016).

In September 2018, eleven European funders gathered in cOAlitionS and signed the so called PlanS, a coordinated action which states that "After 1 January 2020 scientific publications on the results from research funded by public grants provided by national and European research councils and funding bodies, must be published in compliant Open Access Journals or on compliant Open Access Platforms" (Science Europe 2018). PlanS is raising a lot of concerns and debates, but it is indeed a unique opportunity for science and society to build a fairer, more innovative, and open future for scholarly research in which publishers are service providers and not gatekeepers and the whole system can reduce inequity (MacCallum 2018).

It is worth reminding that Open Access does not mean only publishing in Open Access journals, but also self-archiving in Open Access repositories. The latter is always free of charge, whilst publishing might have costs: APCs are requested by 28% of Open Access journals (Morrison 2018). Open Access journals must not be mixed up with hybrid journals, i.e. subscription-based journals offering an Open Choice option. APCs costs and their raising is one of the unsolved issue of Open Access, all the more so when traditional commercial publishers are involved: in UK, APCs has increased by 6%, well above

the cost of inflation, they are unevenly distributed among publishers, with some of them again playing a predominant role, like in the subscription world (Shamash 2016). It is also worth stressing two principles of the above mentioned PlanS: a price cap on APCs will be set, and no hybrid journal will be compliant to the new rules (Science Europe 2018).

In the SSH, the basic transitioning to Open Access publishing practices is even more complicated by uncoordinated activities, a lack of common standards, different levels of quality assurance, and business models not yet sustainable (OPERAS 2017, 48). Monographs are particularly at stake, both for technical and financial reasons, as the recent Landscape study on Open Access and monograph reveals (Ferwerda and Pinter and Stern 2017).

Different business models are possible: Freemium policies for Open Edition, cooperative library support for Open Library of Humanities, crowdfunding library programmes for Knowledge Unlatched, but re-routing of existing founds is still challenging (*Ibid*.).

Open Access to publications, even once achieved, is just the first step: a change is needed in the research evaluation system, as well as a new approach in managing research data, and more transparency in the scholarly communication market costs (Amsterdam Call for Action 2016).

An effective push towards Open Access publishing comes from more and more funding agencies – including the European Commission in Horizon2020 – adopting policies in the name of accountability on public funding and transparency, and, in the end, of the benefit for the whole society (Swan 2015). Open Access is not a goal itself, but a way to enable growth and innovation (European Commission 2012):

> (6) Policies on open access to scientific research results should apply to all research that receives public funds. Such policies are expected to improve conditions for conducting research by reducing duplication of efforts and by minimising the time spent searching for information and accessing it. This will speed up scientific progress and make it easier to cooperate across and beyond the EU. Such policies will also respond to calls within the scientific community for greater access to scientific information.
>
> (7) Enabling societal actors to interact in the research cycle improves the quality, relevance, acceptability and sustainability of innovation outcomes by integrating society's expectations, needs, interests and values. Open access is a key feature of Member States' policies for responsible research and innovation by making the results of research available to all and by facilitating societal engagement.

The Commission again stressed that "Open access helps enhance quality, reduce the need for unnecessary duplication of research, speed up scientific progress, help to combat scientific fraud, and can overall favour economic growth and innovation. Beside open access, data management planning is becoming a standard scientific practice" (European Commission 2018).

This leads to the wider concept of Open Science.

Open Science and SSH.

Commissioner Carlos Moedas stressed the potential of Open Science in refocusing science from a "publish or perish" perspective to that of "knowledge sharing", serving growth and innovation (Moedas and Oettinger 2015):

> Open Science describes the on-going transitions in the way research is performed, researchers collaborate, knowledge is shared, and science is organised. It represents a systemic change in the modus

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operandi of science and research. It affects the whole research cycle and its stakeholders, enhances science by facilitating more transparency, openness, networking, collaboration, and refocuses science from a 'publish or perish' perspective to a knowledge-sharing perspective.

Open science is also about making sure that science serves innovation and growth. It guarantees open access to publicly-funded research results and the possibility of knowledge sharing by providing infrastructures. Facilitating access to those data will encourage re-use of research output. For example, companies, and particularly SMEs, can access and re-use data, infrastructures and tools easily and at a reasonable cost and can accelerate the implementation of ideas for innovative products and services.

Open Science is an ongoing process; according to Burgelman it is irreversible, so it is not a matter of "if" but "when" it will be achieved (Burgelman 2016).

The European Commission is launching two projects aimed at making Open Science a reality.

The European Open Science Cloud (EOSC) is a virtual environment where data is easy to store, find, share and re-use, throughout the value chain, for scientific, societal and industrial purposes. Data providers, service providers, and enterprises are expected to meet there (European Commission 2018). It will be "widely inclusive of all disciplines and all Member States" (European Commission 2017): consider that in SSH texts, images, digitized materials are data, too, so suitable for EOSC.

The Open Research Publishing Platform will be a publicly-owned platform offering a free and fast publication possibility for peer reviewed articles and pre-prints resulting from Horizon 2020 projects. It will "complement the current policy in Horizon 2020 – where open access to publication is mandatory – in order to balance obligations with incentives" (European Commission 2017).

In a joint effort, they may serve as a robust starting point for the development of EU-wide infrastructures dedicated to effectively disseminating peer-reviewed scientific output (OPERAS 2017, 48) and to take the best out of data-intensive science.

The recently launched PlanS (Science Europe 2018) supports and somehow boosters this vision of openness in scholarly communication.

One could object that both the EOSC and PlanS seem strongly STEM oriented, and SSH are marginalized.

In principle, "if SSH disciplines do not integrate with the OpenScience Cloud, the entire scientific ecosystem will fail to reach its full potential since it will be missing the publications and other research outputs from half of the scientific disciplines" (Mounier 2017).

Technically, as the Open Science Monitor provided by the European Commission shows, Open Access to publications, Open research data and Open scholarly communication practices all equally contribute to open up science (European Commission 2017).

Scholarly communication cannot ignore the "fourth paradigm" of data-intensive research (Hey and Tansley and Tolle eds. 2009), nor can be kept hostage in a "deadly embrace" continuing to "conduct, publish and judge research" like in the past (Mons 2016):

> The science system is in landslide transition from data-sparse to data-saturated. Meanwhile, scholarly communication, data management methodologies, reward systems and training curricula do not adapt quickly enough if at all to this revolution.
>
> Researchers, funders and publishers (I always thought that meant making things public) keep each other hostage in a deadly embrace by continuing to conduct, publish, fund and judge science in the same way as in the past century.

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> So far, no-one seems to be able to break this deadlock. Open Access articles are indispensable but solve only a fraction of the problem. Neither 'open research data' alone will do.

That is the reason why Open Science should be an encompassing practice, aimed at opening up the whole cycle of the research. There are more than 400 innovation tools covering all the phases of the research communication cycle – preparation, search, analysis, writing, publication, outreach, assessment (Kramer and Bosman 2016). Researchers can use some of the 400 tools to start their own open research practices (Kramer and Bosman 2018), adopting a "step by step" approach: as Jon Tennant puts it, "To support 'open science' you don't have to agree with or practice the whole messy bulk of it. Share your papers openly; version your code; cite data sets; use open source software; blog. Small steps can make a big difference" (Tennant 2018).

In the end, Open Science perfectly resonates with a more inclusive and dynamic idea of publication. In STEM it corresponds to the recent preprint rise (Bourne *et al.* 2017). In SSH it is clearly expressed by Kathleen Fitzpatrick as the "process" of "being engaged" with our texts (Fitzpatrick 2011):

> communities best engage with one another around writing that is open rather than closed, in process rather than concluded. If we were to shift our focus in the work we're doing as authors from the moment of completion, from the self-contained product, to privilege instead the process of writing, discussion, and revision, we'd likely begin to "publish" work – in the sense of making it public in readable form – earlier in its development (at the conference paper stage, for instance) and to remain engaged with those texts long after they've been released to readers. Although this idea makes many scholars nervous – about getting "scooped", about getting too much feedback too soon, about letting the messiness of our processes to be seen [...] – it's worth considering why we're doing the work in the first place: to the degree that scholarship is about participating in an exchange of ideas with one's peers, new networked publishing infrastructures can facilitate that interaction, but will best do so if the discussion is ongoing, always in process.

One way of nurturing the debate and practising Open Science in publishing is adopting Open peer review (Eve 2014; Fitzpatrick 2011). Open peer review is "an umbrella term for a number of overlapping ways that peer review models can be adapted in line with the aims of Open Science, including making reviewer and author identities open, publishing review reports and enabling greater participation in the peer review process" (Ross-Hellauer 2017). Open Edition, the coordinator of the OPERAS, conducted one of the few experiments deliberately targeting SSH and investing in human mediation rather than tools (Bordier 2015).

The conclusion of this preliminary section, can be summarized as in the OPERAS Landscape study (OPERAS 2017): "Despite the existence of important and pioneering initiatives, further effort is required in order to support a truly innovative vision for scholarly publishing in the digital age", and therefore, in the Open Science era.

OPERAS at work

The challenges of Open Science are bigger in SSH, due to the fragmentation of the publishing and research landscape. Hence, the keyword in OPERAS ought to be "integration".

The OPERAS consortium was born to try to integrate SSH stances for Open Science into a wider idea of a research infrastructure, within the boundaries of ERA, the European Research Area: "the transition to Open Science and the adoption of open innovation principles relies not only on open data sources but also on open communication and participatory processes. Thus, in addition to the computer-aided analysis, the sharing of findings through scientific conversation, the quality assurance and review processes, the editing and writing workflows, the tracking and acknowledgement of core research activities, i.e. the 'scholarly primitives', also have to be supported and integrated in the Research Infrastructure landscape" (Mounier 2017).

OPERAS: what's in a name

OPERAS stands for 'Open Access in the ERA through scholarly communication'. It is not just an acronym. It means that the best way to achieve Open Access "is to do it *through* scholarly communication, which simply means *from within* the scientific community, by close cooperation between its different stakeholders and always considering primarily its specific needs over all other considerations, in particular commercial" (Mounier 2017). OPERAS' main goal is that of a research infrastructure, that "should stand by the researchers and operate *inside* the scientific community to support an essential part of its activity: scholarly communication" (*Ibid.*).

OPERAS is also a metaphor: "Opera is one of the most sophisticated and complex performance arts, because it involves so many different components, symphonic music, lyrical art, drama, and even visual art through scenery and costumes. To perform it correctly, it requires thorough understanding between all the different performers, strong coordination and close cooperation. And then, after a long preparation, when the time for the performance has arrived, the complex machinery must become invisible and serve the artwork smoothly and gently as if it was all natural. An inspiring model, certainly" (*Ibid.*).

OPERAS strategy

OPERAS addresses the publishing system, which still "remains fairly traditional", involves increasingly unbearable costs and impede knowledge exchange with society at large (Amsterdam Call for action 2016). Its main focus is on SSH, more fragmented and thus more in need.

OPERAS started gathering partners of different nature (35 among publishers, research performing organizations, universities, libraries, consortia) and geographical distribution (12 countries involved). A light committment scheme was defined, allowing small size partners, with few resources, to participate through thematic Working Groups dealing with the future OPERAS services.

Operationally, the first step was to analyse the landscape and to imagine a scenario. Several studies have been conducted, on the landscape, the business model, the technical mapping etc., which now are the main part of the OPERAS Design Study (OPERAS 2017). Then, the main findings have been matched against users perceptions and needs to validate them through a survey.

This effort resulted in

- a mission: to provide a pan-European infrastructure for open scholarly communication;
- a vision**:** to coordinate services, practices and technology across main actors in the SSH scholarly communication in Europe to provide joint services; to align activities of strategic

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actors and stakeholders (research institutions, libraries, platforms, publishers, funders) in their transition to Open Science as the standard practice;

- a principle: the project will be led by the principle of subsidiarity, meaning that each partner provides publication and communication services to their own scientific community, but collaborates and shares technologies, know-how, practices;

- a strategy: not supplanting actors but reinforcing their presence, by providing coordination and a distributed service infrastructure; not building the latter from scratch, but leveraging on existing platforms already in place and scaling them at European, multilingual level;

- a concrete outcome: a more efficient, fair, inclusive and sustainable scholarly communication ecosystem for European researchers.

Certify, discover and activate research: how OPERAS serves SSH

OPERAS will operate at three main levels:

1. Service alignment and sharing
OPERAS partners offer services covering the whole research life cycle (literature review, data discovery, communication to peers, peer review, editing, dissemination, marketing, quality assurance), as shown in Figure 1.

Figure 1. OPERAS in the research lifecycle, by Laetitia Martin

OPERAS added value is to provide support to current activities: information, training, adoption of best practices, sharing of tools and research and development. This should result in improved specialization and complementarity in terms of services and business models, leading to more efficiency and innovation. OPERAS' approach is respectful of single players: instead of merging, supporting improvement and service upgrade, instead of replacing, sharing and align.

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2. EOSC integration

EOSC is governed by the FAIR principles, where data must be Findable, Accessible, Interoperable and Reusable (Wilkinson *et al.* 2016). OPERAS drives the partners to adopt common standards (PIDs, metadata, machine readable content to allow Text and Data Mining). Text and data mining is crucial in the EOSC perspective, as it turns *de facto* texts into machine-operable data. HIRMEOS,[1] a project funded in Horizon2020, is a sort of proof of concept for the EOSC integration: not only does it develop common standards, but also deploys a common methodology that enables different partners operating with different software and technologies to implement the developed common standards. At European level, OPERAS increases connectivity and achieve collaboration with general infrastructures (GEANT[2]) and with complementary infrastructures (DARIAH,[3] CLARIN,[4] CESSDA,[5] OpenAIRE[6]) already set to deal mostly with SSH data. The outcome will be a better integration of SSH disciplines into Open Science and will make the resources available for the development of innovative services.

3. Services to certify, find and activate research

OPERAS will develop integrated services at European level, perfectly fitting in what Marc Schiltz's Preamble to PlanS defines as "robust quality criteria for Open Acecss publishing" (Schiltz 2018).

The 3 future platforms will leverage on existing sound ones, currently lacking resources to scale up:

- **to Certify research**: the Certification platform will be based on the Directory of Open Access Books (DOAB[7]). It will provide an international list of SSH open access publications that meet minimal quality criteria regarding peer-reviewing and licensing. It is worth highlighting that good and independent certification services enable better evaluation systems, whose lack in SSH is a prevalent issue: when submitted to research assessment exercises, authors struggle to demonstrate the value of their research outputs and their impact, and of the serious editorial workflow behind their work.

- **to Find research**: the Discovery platform will be based on Isidore,[8] developed by Huma-Num. It will allow all European researchers in SSH to discover, from a single point of entry, open resources (data, publications and other materials) relevant to their research. The added value consists in the feature of indexing resources with disciplinary ontologies and thesauri and to align them across several languages. Moreover, the system can enrich metadata by linking publication to the underpinning datasets, working in synergy with OpenAIRE. Researchers in SSH have been

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[1] HIRMEOS project, http://www.hirmeos.eu/, Horizon 2020 Grant Number 731102.

[2] GEANT, https://www.geant.org/, a collaboration on e-infrastructure and services for research and education.

[3] DARIAH, https://www.dariah.eu/, a pan-european infrastructure for arts and humanities scholars working with computational methods.

[4] CLARIN, https://www.clarin.eu/, European Research Infrastructure for Language Resources and Technology.

[5] CESSDA, https://www.cessda.eu/, a large-scale, integrated and sustainable infrastructure for data services to the social sciences.

[6] OpenAIRE, https://www.openaire.eu/, a network of Open Access repositories, archives and journals offering added value services to researchers and funders.

[7] DOAB, https://www.doabooks.org/.

[8] Isidore, https://www.rechercheisidore.fr/.

longing for such a service for ages: currently, they have to access and search several different platforms providing uneven and inhomogeneous data and not allowing multilingual searches.

- **to Activate research:** the Research for Society platform will be based on Hypotheses,[9] currently the largest academic platform in the world with more than 2000 blogs. The service will develop social networking functionalities to facilitate collaboration between researchers and socioeconomic actors on research projects. The Research for Society service offers a disruptive model for citizen science that complements impact with engagement. The multidisciplinary framework will convey STEM disciplines as well as SSH to address societal challenges identified by the European Union. This will be the most innovative of the three platforms, the one that best interprets OPERAS pervading idea of science as communication: it holds an immense potential for an inspiring model of Open Science with direct societal impact, based on continuous communication.

Conclusion

OPERAS tackles the challenge of renewing scholarly communication practices in SSH in the digital age and in the era of Open Science, at the same time enabling the research community to reclaim control. The landscape is dotted with an array of initiatives (presses, library projects, platforms, service providers, researchers networks), innovative and sometimes with disruptive potential, but mostly small-size, localized, addressing small communities' needs, fragmented, not very collaborative and communicating poorly with their peers. The ecosystem is very fragile, and lacks resources (in terms of skills, know-how and funding) to efficiently manage the digital turn and the integration in the European Open Science Cloud. OPERAS meets the need of synergizing and creating a critical mass, without replacing but nurturing existing realities. As a distributed research infrastructure, OPERAS will open the many locks that prevent the SSH sector from upgrading their practices and integrating into the Open Science paradigm, providing a pan-European platform dedicated to open scholarly communication including publications.

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