The Role of Current Research Information Systems (CRIS) in Supporting Open Science Implementation: the Case of Strathclyde

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Abstract

CRIS systems are playing an increasingly relevant role in the implementation of Open Access and Research Data Management (RDM) policies at research-performing organisations. This is not just because of the deep insight these systems provide into the workflows that underpin the institutional research activity, but also because they allow an effective teamworking across institutional research support units, which critically include research libraries.

This article describes the way the institutional Pure CRIS is used at the University of Strathclyde in Glasgow to support the implementation of Open Science in collaboration with the researchers themselves and with the institutional Research Office. In terms of training, which is in itself an important and often challenging part of the effort towards Open Science implementation, the key objective is to make researchers aware that all the seemingly independent processes they're being asked to carry out on top of their research activity are interconnected and are part of the same drive towards openness and digital science.

Finally, the paper describes the international collaboration networks for the realisation of Open Science that the University of Strathclyde is involved in and some of the areas where this cross-institutional collaboration is taking place.

Keywords

Open Science; Research Information Management; Open Access; Research Data Management; Scholarly Communications; Current Research Information Systems (CRIS); Institutional case studies

Introduction

A euroCRIS Strategic Membership Meeting was held at CVTI SR in Bratislava on November 21-22, 2017 under the banner 'Research Information and Open Science' [1]. Several contributions to the event addressed the use of Current Research Information Systems (CRIS) for Open Science implementation at research-performing institutions, such as "From data collection to FAIR use in CRIS. The case of University of Vienna" [2] or "OMEGA-PSIR: Institutional CRIS at Polish Universities" [3]. The various case studies presented during the meeting highlighted the increasingly relevant and frequent role that CRIS systems are playing in this domain. By implementing the appropriate workflows for Open Access and Open Research Data policy compliance on top of the often already existing mechanisms for research output reporting to ministries or funders for research assessment purposes, these systems are effectively supporting the advocacy strategies at institutions and specifically at research libraries.

CRIS systems are widely implemented in the UK, where they've become key elements for the institutional reporting to research funders and for the Government's Research Assessment Framework (REF). Partially because of the fast-changing nature of the landscape, there is currently no national-level CRIS directory in the country, but the UK is likely to be the European country with the largest number of fully operational CRIS systems at institutions. There are UK Pure, Converis and Symplectic Elements user groups for the major platforms plus a number of smaller vendors like Worktribe, all focused on delivering the best possible REF reporting features to institutions[1].

George Macgregor @g3om4c — Follow

Ruminating on dev approaches to #CRIS systems & seeking feedback from the hive mind. Excepting *Pure*, what level of involvement do user groups have in dev of @Symplectic @worktribe #converis etc.?

3:01 AM - 26 Jan 2018

Fig 1. Communications around the wcork of User Groups are often informally held over social media

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[1] With rare exceptions like this 2014 Converis UK User Group meeting reported at *https://imathull.wordpress.com/2014/03/31/cris-at-thomson-reuters-the-converis-uk-user-group/*, work conducted within these User Groups for vendor-provided CRIS solutions tends to be internally run and not openly reported, even if vendors are gradually staging more open and international user group meeting as their customer base widens, see for instance the recently held Symplectic European User Conference 2018, *https://symplectic.co.uk/events/european-user-conference-2018/.*

These institutional solutions for research information management often coexist with institutional repositories aimed to expose the institutional research outputs to the outside world. The different and complementary character of both kinds of systems has been documented elsewhere [4], so it suffices to say here that the CRIS+IR configuration, with an embedded 'connector' that typically enables the metadata transfer between both systems, is both the most widely implemented and the most effective solution. The University of Strathclyde is running an EPrints-based institutional repository (Strathprints) since 2006, while the institutional Pure CRIS was launched in 2011.

Open Science policies, both for Open Access and for Research Data Management, are typically being issued by research funders like the European Commission or the UK Engineering and Physical Sciences Research Council (EPSRC), which then rely on institutions for their implementation. This is because institutions lie much closer to funded researchers and are ideally placed to design and carry out an advocacy strategy that addresses an increasingly complex policy scenario where different funders have different requirements. With a deep knowledge of the policy landscape and having access to institutional CRIS systems for – at least – metadata validation purposes, institutional research libraries become then the key contact point for Open Science policy compliance. By designing a strategy towards policy implementation that relieves researchers of as much of the administrative burden as possible, libraries find themselves in a privileged position to become the institutional entry point for the Open Science agenda. Furthermore, the kind of research support services being presently delivered in the UK for Open Science implementation rank among the best-valued library services among researchers. At a time when academic libraries are looking for a meaningful role to play in an increasingly electronic future [5], these considerations are worth being kept in mind.

Open Access policies in the UK: a complex landscape

The Open Access policy landscape in the UK and its specific approach to Gold Open Access as per the recommendations of the 2013 'Finch Report' [6] are often perceived to be out-of-synch with the policies and implementation strategies followed elsewhere in Europe. There is however some degree of misunderstanding in this perception. While research funders like the Research Councils UK have financially supported the widespread payment of Open Access publishing fees over a 5-year initiative (2013-2018) whose outcome will soon be assessed, the main driver for this initiative is the conviction that immediate Open Access is the most suitable mechanism for ensuring the highest possible social and economic impact for the results of their funded projects and the most suitable means for enabling an effective knowledge transfer between Academia and Industry [7].

When assessing how much of an outlier the British position on Open Access represents within the wider European landscape, it's worth bearing in mind however that beyond the 'Gold rush', the UK is possibly the European country where Green Open Access is simultaneously being implemented in the most efficient fashion. This is a direct result of the Open Access policy issued by the Higher Education Funding Council for England (HEFCE) in 2014 [8]. This national-level policy is aligned with the recommendations of the EU-funded PASTEUR4OA project [9] with regard to coupling the Open Access policy requirements to the research assessment exercise (the UK Research Excellence Framework or REF). The HEFCE Open Access policy is being implemented in a coordinated way across research-performing institutions in the UK with remarkably high compliance rates since it officially started being implemented in Apr 2016. The University of Strathclyde is for instance registering close to 95 % compliance rates these days in the HEFCE OA policy compliance reports that are produced on a monthly basis to monitor the progress in its application.

This HEFCE Open Access policy states that for a journal article or conference paper to be eligible for the research assessment exercise, its full-text accepted author manuscript must be deposited in an institutional system as soon as possible upon manuscript acceptance and no longer than three months since the actual date of acceptance. The strength of the policy arises from its link to the research assessment exercise – which every Head of Department and Director of Research at the University is extremely well aware of since it directly impacts both the institutional funding and its prestige. This policy means that a sustained effort from the research library to raise awareness of the publications failing to meet the HEFCE policy requirements can result in the gradual integration of this fairly uncomplicated step – the deposit of the full-text accepted author manuscript as soon as possible upon acceptance – into the standard publishing workflow. The goal of an effective dissemination strategy becomes thus to make researchers aware that the publishing process does not finish when a paper is finally published, but when this full-text post-print has been deposited.

Other Open Access policies issued by research funders applicable in the UK include the European Commission's policies for FP7 and H2020 projects and the Wellcome Trust's (see a summary for the main applicable policies in the table below). Both the EC and the Wellcome require Open Access to all research outputs stemming from their funded projects, and both of them offer a two-pronged compliance workflow covering Green and Gold Open Access, making funding available for the payment of Open Access publishing fees or APCs.

Research funder	OA flavour	Brief policy description
Higher Education Funding Council for England (HEFCE)	Green	In operation since 01/04/2016 (implemented since 2014 at Strathclyde). Mandatory deposit of full-text accepted author manuscript no longer than three months since manuscript acceptance. Linked to the UK Research Excellence Framework (REF2021)
Research Councils UK (UK Research and Innovation since 01/04/2018)	Green & Gold	Mandatory OA availability of funded outputs either via the Green or the Gold OA routes. Block grants delivered to research-intensive HEIs to fund Open Access fees for eligible publications (those that acknowledge RCUK-funded projects)
Charity Open Access Fund (COAF): coalition of UK charities led by the Wellcome Trust	Green & Gold	Mandatory OA availability of funded outputs either via the Green or the Gold OA routes. Block grants delivered to research-intensive HEIs to fund Open Access fees for eligible publications (those that acknowledge RCUK-funded projects). Green OA publications need to be deposited in EuropePMC
European Commission – FP7 programme	Green & Gold	Mandatory deposit of full-text accepted author manuscript for projects under Clause 39. Gold Open Access funding available for finished FP7 projects under the OpenAIRE FP7 Post-Grant OA Pilot
European Commission – H2020 programme	Green & Gold	Mandatory deposit of full-text accepted author manuscript for all H2020 projects (plus associated datasets). Gold Open Access funding may be claimed from project grant

Table 1. Main Open Access policies by research funders at the University of Strathclyde

Research funders like the RCUK and the COAF provide block grants for Gold Open Access funding to research-intensive institutions in the UK, under a policy that – as opposite to most Open Access policies issued by national funders in Europe – does not ban the provision of funding for manuscripts accepted in hybrid journals. On top of this, a number of UK universities also have institutional Open Access funds which are often managed under a fully-Open-Access-only or 'no-hybrid' policy.

Libraries typically try to summarize this complex policy landscape and its implications for Open Access funding in their research support websites, often together with the pre-payment agreements that they have signed with specific publishers to simplify the always complex APC payment procedures [10]. There is little chance however that researchers will be able or willing to take the time to explore the implications of this array of policies for a specific publication of theirs. Unsurprisingly, they tend instead to contact their library about a specific accepted manuscript in order to find out what workflow they should follow in order to both comply with the applicable policies and benefit from any of the multiple funding opportunities these offer.

In the absence of an institutional Open Access fund (as it is the case at Strathclyde) that can create a level playing field, a key aspect to bear in mind when examining this landscape is the fact that Open Access funding as offered by the above-mentioned research funders is typically restricted to manuscripts that acknowledge a funded project by any of such funders. This limitation in eligibility automatically creates a significant divide across funded and unfunded disciplines, departments and authors at institutions. Strathclyde being a technical university focused on Engineering and the Sciences, it has very strong research funding streams from stakeholders like the Research Councils UK (and specifically the Engineering and Physical Sciences Research Council or EPSRC), while the amount of funded projects in areas like Biomedicine or – especially – the Social Sciences and Humanities is much lower. The disciplinary bias that this uneven distribution of funded projects creates is very evident on the statistics on number of funded publications and the distribution of funded publishers at the institution.

The situation at non-research-intensive institutions in the country is also worth being separately examined, as these universities where teaching has a higher priority than research are usually not eligible for any block grant that funders typically restrict to research-intensive institutions. The HEFCE Green Open Access policy becomes then a life-saving instrument for research support services at these smaller players, which usually also lack any institutional Open Access funding. Smaller institutions are then unable to exploit the significant value of the Open Access funding opportunities for an optimal researcher engagement strategy as described below. This inevitably results in far lower rates of policy compliance for these institutions.

Open Access implementation at Strathclyde

The Strathclyde strategy for Open Access implementation places the need to comply with the HEFCE Green Open Access policy at its core. This means that for all publications covered by the policy – i.e. journal articles and conference contributions for proceedings with an ISSN – researchers need to create a record in the appropriate institutional system in which the date of manuscript acceptance and the full-text accepted manuscript are included. Since the policy is coupled to the national-level research assessment exercise (REF2021), authors are constantly reminded that in order for their publications to remain eligible for this assessment exercise, they need to be made available in the system as soon as possible upon manuscript acceptance and no longer than three months since the date of acceptance.
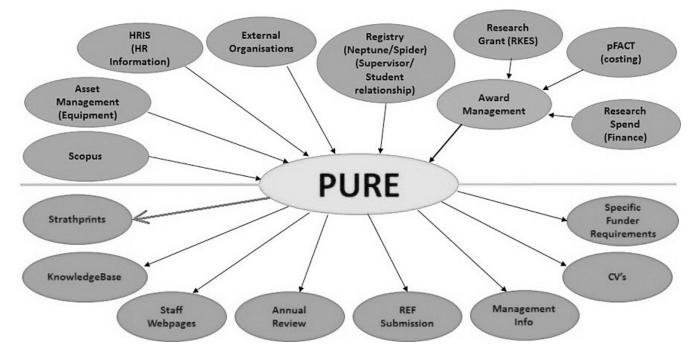
Fig 2. Pure CRIS at the centre of the institutional system configuration at Strathclyde

The institutional system that Strathclyde uses for deposit purposes is its Pure CRIS system. In fact, as shown in the figure above, Pure sits at the centre of the institutional system configuration at Strathclyde. The fact that a CRIS system is used as the default deposit platform both for publications and for research data instead of the Eprints-based institutional repository Strathprints or a data repository has its upsides and its downsides, but the former tend to outweigh the latter ones. Some of the advantages of using Pure as the default system for institutional authors to deposit all their research outputs are:

- By unifying the deposit system for publications and research data, the CRIS system becomes the *one-stop-shop for researchers* to deal with all the administrative requirements to meet the research funders' policies with regard to Open Science;
- Keeping in mind that the CRIS offers additional features well valued by authors such as citation counts, automatic linking between research outputs and funded projects or the possibility of directly selecting the publications to be returned for the REF, researchers clearly see the value of using this system for their regular research administration tasks;
- The Pure user interface is rather friendly and it includes numerous fields where pre-populated information is available, especially in areas like co-authors, affiliations, journals and their deposit policies, projects or related items such as datasets. This, together with the possibility to automatically import metadata from Scopus, makes the process for creating a new record very simple;
- Training on the use of Pure for newly arrived researchers is delivered on a monthly basis via sessions where the Strathclyde Research Office and the Scholarly Communications team collaborate in order to jointly cover all the institutional workflows supported by the platform;
- Pure is not an Open Access platform: this means that researchers needn't worry about depositing an accepted manuscript in it that hasn't been published yet. Every record that gets created needs to be

validated by the library staff before a given Open Access status is assigned to it according to the specific publisher permissions. While the record reaches its turn in the validation queue, it typically remains in 'For validation' status, which does not mean Open Access;

- An accepted manuscript does not get openly released at the institution while it's awaiting validation, but its full-text can be accessed by the Open Access team at the library, who are able to check the funded project acknowledgements it contains and get back to the Strathclyde researcher if the manuscript is eligible for funding;
- Pure also contains specific fields for typing in the APC fees paid for a specific publication. This allows the Gold Open Access-related expenses to be stored in the system;
- There is a large number of institutions running Pure, both in the UK and abroad. This has significant implications both in terms of the cross-institutional workflow re-usability and also for interoperability purposes with regard to third-party solutions like the research funders' ones.

Not everything is optimal though, and a few disadvantages in this configuration can also be mentioned:

- Pure is neither an institutional repository nor a data repository, which means that another system must be used for Open Access (and Open Research Data) policy compliance purposes: this is typically achieved by coupling the CRIS system to an institutional repository (Strathprints in the case of Strathclyde [11]), but the interoperability mechanism (or "connector") that automatically transfers both metadata and full-text from Pure to an Eprints-based repository has numerous issues at the moment [12];
- Fedora-based repositories have it even worse in this regard: there is no operational connector with Pure for them; these connectors are typically only made available for the mainstream solutions;
- Pure is not OpenAIRE compatible, or not yet. While the euroCRIS-led METIS2OpenAIRE project [13] aims to progress in the implementation of the OpenAIRE Guidelines for CRIS Managers, this will still take some time. In the meantime, if the institutional repository is not OpenAIRE-compliant, EU-funded authors may face issues when trying to comply with the EC Open Access policy via the standard workflows at the institution;
- Pure acts as a master system while the repository acts as a slave: this means that the content in the latter is regularly overwritten, making it very difficult to maintain independent collections in it for instance for grey literature;
- While there is a UK Pure User Group where discussions take place regularly among institutional representatives, the requests for functionality enhancements tend to take a long time to be fulfilled due to the very large customer base for the product.

In terms of the role played by the CRIS system for supporting the researcher engagement strategy at Strathclyde the key advantage is its ability to display the links between publications, projects and persons. Because the library is able to match the details for a specific funder policy against the funded project information contained in the manuscripts, it is ideally placed to reach out to institutional authors warning them about an opportunity to have Gold Open Access funded from the library for their manuscript.

This effectively offers an opportunity to couple Green and Gold Open Access implementation strategies: by offering authors a service they value very much (Open Access funding), it is possible to integrate all the Open Access-related advocacy activity, and researchers who have previously received APC funding or are expecting to receive it in the future are far more likely to reply to requests to please upload a missing accepted manuscript or provide a specific date of acceptance that's not in the record for a publication.

Once a conversation begins to take place with a researcher – and these typically start with notifications for possible eligibility for Open Access funding – the chances that any subsequent Open Access-related exchange will be integrated into this conversation are very high. Especially if the library staff are able to get an insight into the specific project funding workflows and publication history for the author. CRIS systems are perfect tools for these latter tasks, since their highly-structured and interconnected data model is precisely designed for this purpose.

It´s also worth mentioning that notifications on Open Access funding eligibility are occasionally turned down by researchers due to issues with high APC fees or simple preference towards Green Open Access, much to the satisfaction of the research support team. It's not so much that there's a widespread support for APC-based Gold Open Access, but rather a question of exploiting the potential benefits it offers for Open Access advocacy purposes.

Institutional Research Data Management workflows

The conversations with Strathclyde researchers that often start with a notification for Open Access funding eligibility will also frequently cover the area of research data management. At Strathclyde the workflows around

publications and research data are processed in a separate way by different members of the scholarly communications team, but they are all sitting together in the same office.

This means that two different conversations that a researcher would need to have with the research support team – on Open Access compliance for an accepted manuscripts and on adequately formatting and having a DOI minted for a supporting dataset – can frequently be merged into a single one, see figure below. This integrated research support for all aspects related to scholarly publishing is highly valued by researchers, who, as they frequently state, are typically too busy doing the research, writing the papers, dealing with the peer-reviewers and arguing with the publishers at manuscript processing stage to be able to take one more layer of issues related to licensing, eligibility for Open Access funding, processing of supporting research data, issuing a data statement or navigating the frequently very complex workflows for APC payment. There is much value in a reliable, efficient service that allows them to transfer the responsibility of these last stages of the publishing cycle onto their research support team. Getting all this extra support in return for just a simple request to please create a record into the system as soon as possible upon manuscript acceptance with the full-text accepted manuscript and a link to any associated datasets in it sounds like a fair deal, and most authors acknowledge this.
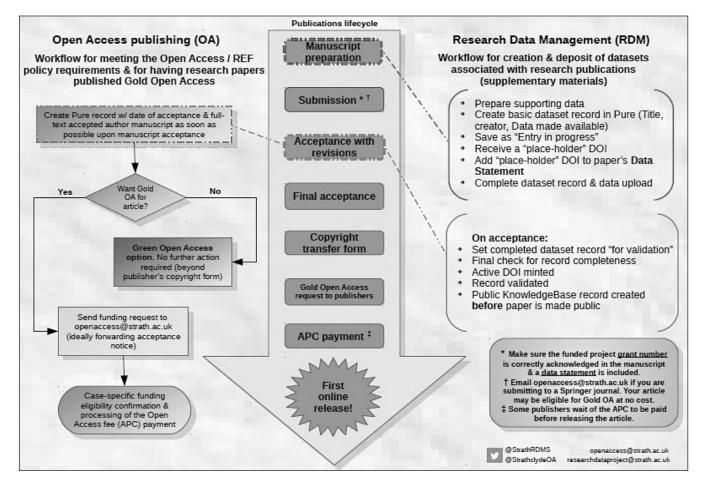

Fig 3. Integrated OA/RDM workflows at the University of Strathclyde

The research data management activity at Strathclyde is again strongly driven by the research funders' policies on the matter. Both the EPSRC at a national level and the EC at European one have clear deposit requirements for research data underpinning a publication [14]. A specific RDM advocacy strategy towards researchers is permanently running at the institution, and it's not unusual that researchers aware of the need to comply with the policies will request specific meetings with the institutional RDM team to discuss the specific approach to Data Management Plans (DMPs) and the wider RDM issues for a specific work. These are perfect opportunities for providing all the necessary information and training to ensure that researchers will in the future be able to deal with the workflows on their own – otherwise the support activity both for publications and for datasets would hardly be sustainable with over a thousand active researchers at the institution.
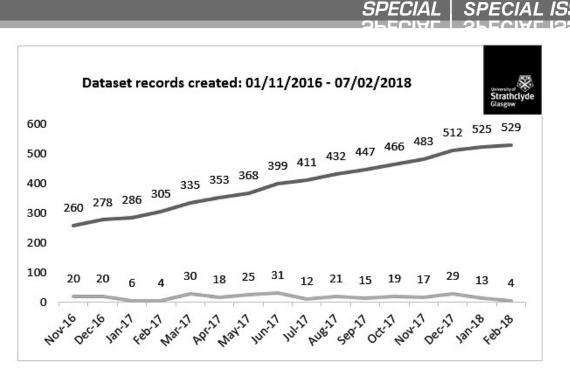
Fig 4. Growth in the number of deposited datasets at Strathclyde (as of Feb 7th, 2018)

The internal coordination within the scholarly communications team at the library is then seen as a key requirement for the research support service towards institutional authors to be as simple and as comprehensive as possible. This is not always easy with a frequent work overload in terms of the sheer number of support requests to cater, but the results provide sufficient evidence for the value of this integrated approach: it's not just that hundreds of datasets have already been stored in Pure and linked to the relevant publications and funded projects (see figure 4 above), but that researcher awareness is steadily growing both on their expected behaviour in the domain and on the existence of a support team ready to help with any query. These include for instance how to proceed with regard to data deposits in external, typically subject-specific data repositories, how to make sure the requirements issued by international funding bodies such as the EC are met or how to deal with sensitive data arising from collaborations with industry.

The emphasis currently made by research funders on aspects such as data deposit or issuing of DMPs and data statement policies remains much lower than for their Open Access-related counterparts. As a consequence, the rates of data policy compliance are also significantly lower than for publications. The figures – for instance for the EPSRC policy – are still fairly healthy and there is a constant monitoring of EPSRC-funded publications to check if there have associated datasets that may not have been deposited in Pure and if there are missing data statements in them. All the notifications and reminders that get subsequently sent to authors of non-compliant items are gradually increasing the awareness and making researchers realise that same as the publishing cycle does not end with the online release of their paper but with the deposit of the accepted manuscript into Pure, the cycle also needs to include an adequate data management practice.

While research funders' policies for Open Access to publications and for data management prove extremely helpful for awareness-rising purposes, the actual goal in both areas is to turn this 'Open Science policy compliance' advocacy mantra into the gradual conviction that *researchers need to do this by default because it's the right thing to do regardless of whether they happen to be funded by a specific funding body or not*. This is quite a challenge and is very much a work in progress, but it's good to know that many institutions are jointly pushing for this in a reasonably well coordinated way, not just in the UK but across the whole of the EU.

Other research support tasks in the scholarly communications area

The main additional research support area that the scholarly communications team at Strathclyde are addressing at the moment is institutional publishing. While there is yet no Open Journal Systems (OJS) platform to support the institutional journals published from the various departments, this is very much part of the plans for the short-term future. In the meantime, the support is targeting publications such as reports, white papers or similar 'grey literature' outputs that are being published by research teams at the institution without meeting fairly basic publishing standards in the areas of licensing or persistent identifiers [15].

This is closely linked to the attempts to gradually raise awareness of the value of alternative metrics and to promote a regular dissemination of research outputs on social media by researchers and departments themselves. Without the appropriate standards of publishing, the potentially very large impact of highly valuable institutional publications becomes impossible to monitor, and such publications get condemned to a certain degree of 'digital obscurity'.

These are particularly useful aspects to raise with researchers in the Social Sciences and Humanities, who remain otherwise cut off (to some extent at least) from the general advocacy efforts around Open Access to publications and research data management. Because of the specific publishing patters in these disciplines, and because there are far fewer funded projects in the domain, researchers in the HaSS often tend to feel detached from the very Engineering- and Sciences-focused advocacy strategies for scholarly communication, and do subsequently feel they're being dragged down a research evaluation path that should not be applicable to their research fields.

The institutional research support team at Strathclyde is well aware of these disciplinary differences, and also of the fact that very valuable research outputs are constantly arising from the work in them – the advocacy around early deposit of full-text manuscripts in the institutional Pure CRIS again helps in their early identification. It is important then to have the right workflows in place to ensure that these publications achieve the kind of visibility and research impact they deserve to have.

Cross-institutional collaboration around policy implementation

When looking at the activity being carried out around Open Science implementation beyond a strictly institutional perspective, one of the most exciting developments that can be seen taking place is the gradual arising of a distributed research support network across institutions (at a national level) and also across countries. This is particularly valuable for dealing – as we all typically do – with multi-institutional, international research outputs at a time when researcher mobility is at a historical maximum. While this distributed research support network is clearly a very ambitious objective in view of the massive differences across institutions and countries in areas like staffing, institutional system availability or the level of support provided by national-level policies, we are gradually getting there.

As an institution running a CRIS system and implementing the integrated approach to Open Science implementation described above, Strathclyde can easily act as a hub in a cross-institutional network. Because the institutional scholarly communications team is able to see the links between funded-project acknowledgements and institutional affiliations, it can provide valuable information to colleagues at other institutions – either national or international – on accepted manuscripts with co-authors "of theirs" in them. Furthermore, online funded project databases like CORDIS for the EC or the RCUK's Gateway to Research [16] allow research support services to draw the links between funded projects and all the external institutions that the team of researchers behind a given project is affiliated with. A well-oiled network of institutional research support services could be able to constantly exchange bits and pieces of information on accepted manuscripts, their deposit for Open Access policy compliance purposes and the payment of their APC fees.

The University of Strathclyde is privileged in this sense to be part of the Open Access Scotland Working Group [17]. This is a rather informal group of Open Access practitioners across Scottish institutions with representation from nearly every university and research centre in Scotland. Members of this group hold 'plenary' face-to-face meetings twice a year where all things Open Access are discussed with a particular emphasis on the implementation of the key HEFCE Open Access policy. A working group mailing list and additional smaller meetings to discuss specifically relevant areas such as research data management or the implications of data protection policies add to the value that this group offers in terms of ensuring an effective communication of research support services and staff across institutions in Scotland.

Besides being a member of this national/regional group, Strathclyde is currently holding the Presidency of the CESAER network of European technical universities [18]. This is an international network of over 50 disciplinary-aligned institutions – a very interesting feature when it comes to Open Access implementation – in 26 countries, mostly European ones. There are several CESAER task forces to allow cross-institutional work on different areas, one of these being the CESAER Task Force for Open Science (TFOS). An Open Access Working Group jointly coordinated from TIB Hannover and the University of Strathclyde runs under the umbrella of this CESAER TFOS. With 15 institutions from 11 countries represented in the group, the monthly coordination calls offer a precious opportunity to explore the kind of collaboration that could be carried out across the all-European network of research support services mentioned above. Also, because of the similarity across institutional research profiles in the group, there are potential opportunities for joint advocacy and technical work in areas like supporting the negotiations around an Open Access clause with big publishers, like OpenAIRE compliance or like analysing and jointly addressing very different national-level policy scenarios [19].

In the framework of the current negotiations around Open Access being held in Germany, one of the key worklines this CESAER working group on Open Access implementation is addressing is the identification of institutional researchers involved in journal editorial committees and the subsequent advocacy strategies to be jointly adopted in this regard. CRIS systems like Pure again offer very interesting features for this identification of members of journal editorial committees at institutions – as long as researchers have delivered that kind of information into their institutional system.

It's also worth pointing out in this regard that although CRIS systems may seem to be all about cross-institutional competition (for funding, for research impact, for the best researchers out there), they can also become extremely valuable tools to support cross-institutional collaboration when appropriately used for the purpose. This tension between competition and collaboration actually underpins the whole current discussion on how to best support higher education and research from institutions and specifically from research libraries, for which collaboration is traditionally one of their strongest assets if not the strongest altogether.

The potential role for a national-level CRIS system

While the description of the institutional Open Science implementation strategy above includes plenty of references to the Pure system at Strathclyde, it is important to highlight that the value of the institutional system lies rather in the fact that it's able to provide the required links between publications, projects, persons and affiliations. This is something that any CRIS solution should be able to do, and while Pure does very effectively cover these relations among different entities, it's far from being the sole solution available.

There's in fact a lot of ground that a national CRIS may also be able to cover in terms of implementing Open Science, especially if backed by the appropriate policies regarding Open Access and research data management. A mandatory deposit of the metadata for publications in order for them to be eligible for national-level research assessment purposes is a valuable asset to start with, even if works much better – as demonstrated above – when reinforced with a policy aligned with the one the European Commission issued for H2020 projects.

Even in the absence of specific Open Science policies and even if the network of institutional systems were partially missing that should support any mandatory deposit at a level much closer to researchers, the main value that a CRIS provides – namely the link between different entities and especially between publications and funded projects – is still there for a carefully populated national CRIS. The effectiveness of the research support effort may obviously be affected by the above-mentioned shortcomings, but such cross-entity link allows lists of publications per project to be produced, and allows the simple identification of research outputs that acknowledge EU-funded projects and should subsequently be deposited into an institutional repository or into Zenodo [20].

Under such conditions, the main area to address in the gradual development of a more functional infrastructure would be system interoperability, both across institutional systems at a national level and with external stakeholders like OpenAIRE. The presence of the Slovak Centre of Scientific and Technical Information next to the German Research Foundation and the Chilean CONYCIT on the list of research funders about to exchange their funded project information with OpenAIRE is in fact excellent news in this regard [21]. Emerging tools to enable an automatic transfer of records across systems based on the co-authors' affiliations such as the OpenAIRE Broker service [22] or the Jisc Publications Router in the UK [23] will significantly simplify the content management side of the equation. The key missing piece will then be to bring the research information management activity as close to the actual research practitioners as possible.

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