BRIEF

Research Integrity through Open Science and FAIR Data

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SPARC Europe

1. Introduction

This briefing will help senior managers and policy makers in research performing organisations understand how changes in research practice towards open science and FAIR data principles can be leveraged to help meet higher expectations in the area of research integrity. The briefing recaps key research integrity principles, the policy measures being taken to apply them, and the issues these aim to address. It then considers the role of open science and FAIR principles, focusing on research support strategies that research performing organisations can take action on. It ends with an outline of how the emerging European Open Science Cloud will help them to facilitate change in these areas, by providing a governance framework for research performing organisations to share data services, within and beyond EC member states.

2. European frameworks for research integrity

Before addressing the role of Open Science in research integrity, it is important to understand the definition and breadth of scope of research integrity as defined by key policy makers in Europe. ALLEA's European Code of Conduct for Research Integrity identifies four main governing principles as follows:[1]

- *Reliability* in ensuring the quality of research, reflected in the design, the methodology, the analysis and the use of resources.
- *Honesty* in developing, undertaking, reviewing, reporting and communicating research in a transparent, fair, full and unbiased way.
- *Respect* for colleagues, research participants, society, ecosystems, cultural heritage and the environment.
- *Accountability* for the research from idea to publication, for its management and organisation, for training, supervision and mentoring, and for its wider impacts.

According to Science Europe's Roadmap,[2] there are four main ways that co-ordinated policy development can boost research integrity results in a stronger research environment. These align well with the organisation's strategic goals, as follows:-

- *Harmonised procedures* for dealing with research integrity, across disciplines, institutions and borders. This aligns with the goal of supporting 'borderless science' – "ensuring that researchers and research organisations can collaborate at the level of projects, programmes and facilities"
- *Efficiency of the R&D system* through increased trust between scientists and in scientific results, and by reducing the likelihood that funding is misused. This aligns with "Facilitating science – ensuring the efficiency and effectiveness of the research system, and fostering research potential."
- *Building public support for science* and reducing the risk of misinformation based on misguided research. This aligns with "Communicating science – ensuring that research results are utilised in the best way possible, both within and beyond scientific communities."

[1] ALLEA (2017) The European Code of Conduct for Research Integrity. https://ec.europa.eu/research/participants/data/ref/h2020/other/hi/h2020-ethics_code-of-conduct_en.pdf, p. 4

[2] Science Europe (2013,) Science Europe Roadmap https://www.scienceeurope.org/wp-content/uploads/2014/05/ScienceEurope_Roadmap.pdf, pp. 3-4, 21-22

- *Fairer career advancements* by reducing risks of fraudulent results, by cultivating good research practices and embedding them in an improved research culture, and by strengthening the global normative framework around research integrity. This aligns with 'Improving the scientific environment – ensuring that research careers are facilitated and research institutions strengthened."

These objectives are increasingly being adopted across the research community, as are the principles of good conduct. Concepts of misconduct are also widely shared. These are embodied in the OECD's influential guidance which highlights six aspects of misconduct, as follows:[3]

- *'Core' research misconduct*; plagiarism of others' ideas, processes, results, or words without giving due credit, fabrication and falsification. This includes selectively excluding data from analysis, misinterpreting data to obtain desired results (including inappropriate use of statistical methods), doctoring images in publications, or producing false data or results under pressure from a sponsor.
- *Data-related misconduct*: not preserving primary data, bad data management or storage, or withholding data from the scientific community.
- *Research practice misconduct:* Using inappropriate (e.g., harmful or dangerous) research methods, poor research design. Experimental, analytical, computational errors. Violation of human subject protocols; or abuse of laboratory animals.
- *Publication-related misconduct:* Claiming undeserved authorship. Denying authorship to contributors Artificially proliferating publications ("salami-slicing"). Failure to correct the publication record.
- *Personal misconduct* Inappropriate personal behaviour, harassment. Inadequate leadership, mentoring, counselling of students. Insensitivity to social or cultural norms.
- *Financial, and other misconduct*: Peer review abuse e.g., non-disclosure of conflict of interest, unfairly holding up a rival's publication. Misrepresenting credentials or publication record. Misuse of research funds for unauthorised purchases or for personal gain. Making an unsubstantiated or malicious misconduct allegation.

At least the first four of these categories of misconduct can be addressed by changes in practice to implement FAIR principles in the direction of greater openness. This link between openness and integrity is influencing national level policy-makers to link their policies to connect greater data access with enhanced research verification. For example, the recently revised (2018) Code of Conduct for Research Integrity for the Netherlands sets out standards for researchers that include contributing to FAIR data, and making research data and findings public.[4] The Code also identifies data management among the duties of care that Institutions are expected to uphold, calling for them to ensure that data is "open and accessible to the extent possible and remains confidential to the extent necessary." Open science is also mentioned as one of the advances in research practice likely to require future changes to the Code. Furthermore, the UK Research Councils' Concordat on Open Research Data envisages that open data principles will help the research community demonstrate that

[3] OECD (2008), Best Practices for Ensuring Scientific Integrity and Preventing Misconduct: http://www.oecd.org/science/inno/40188303.pdf, p. 3

[4] NWO (2018,) Netherlands Code of Conduct for Research Integrity https://www.nwo.nl/en/policies/scientific+integrity+policy/netherlands+code+of+conduct+for+research+integrity, p. 21

appropriate mechanisms are in place to assure research integrity, and was framed as a companion to the existing Concordat on Research Integrity.[5]

3. Pathways for open science and FAIR data principles to foster integrity

Research Integrity is one of the eight priorities identified by the Open Science Policy Platform (OSPP), the high-level advisory group established by the EC to support policy implementation in response to the Amsterdam call for Action on Open Science.[6] As well as research integrity, the OSPP recommendations [7] cover the following priority areas:

- Rewards and Incentives
- Research Indicators and Next-Generation Metrics
- Future of Scholarly Communications
- European Open Science Cloud
- FAIR Data
- Skills and Education
- Citizen Science

These priorities are closely interconnected. Open science and FAIR data principles can enhance integrity if organisations take action across these priority areas. FAIR principles refer to the findability, accessibility, interoperability and reusability of research data. They are core operating principles for the European Open Science Cloud, and intended to boost research integrity and public trust in science, according to the European Commission's report on FAIR 'Turning FAIR into reality'. (p. 7) The report recommends that funders incentivise the reuse of FAIR outputs when appropriate by promoting this in funding calls and requiring research communities to seek and build on existing data wherever possible.[8]

Leading research universities are also connecting integrity with openness. According to LERU, which represents 23 leading universities in Europe, "Open Science practices, such as open access publishing, open data, open peer review and open research, have the potential to bring about new and exciting pathways for supporting a culture of research integrity".[9] Research organisations across Europe are increasingly developing their own research integrity policies, drawing on national policies for guidance. The OSPP recommends that this type of local policy should include the promotion of good research practices, clear procedures for dealing with allegations of research misconduct and a description of possible sanctions for proven cases of misconduct. [10]

The OSPP recommends additional measures identified below. These further highlight the overlaps between integrity, Open Science and the FAIR data principles. Open science and

[5] UKRI (2016) Concordat on Open Research Data https://www.ukri.org/files/legacy/documents/concordatonopenresearchdata-pdf/, p. 5

[6] Amsterdam Call for Action on Open Science (2016) https://www.government.nl/documents/reports/2016/04/04/amsterdam-call-for-action-on-open-science

[7] European Commission (2018) Integrated advice of the Open Science Policy Platform https://ec.europa.eu/research/openscience/index.cfm?pg=open-science-policy-platform, p. 6

[8] European Commission (2018) Turning FAIR into reality https://publications.europa.eu/en/publication-detail/-/publication/7769a148-f1f6-11e8-9982-01aa75ed71a1/language-en/format-PDF/source-80611283 pp. 7, 34.

[9] LERU (2018) 'Open Science and its role in universities' Advice Paper - https://www.leru.org/files/LERU-AP24-Open-Science-full-paper.pdf, p. 20

[10] European Commission (2018) Integrated advice of the Open Science Policy Platform https://ec.europa.eu/research/openscience/pdf/integrated_advice_opspp_recommendations.pdf#view=fit&pagemode=none, p. 9

scholarship involve a shift towards scholarly research that is collaborative, transparent and reproducible where outputs are publicly available. As a related SPARC Europe briefing for policymakers and senior managers on FAIR and Open Data points out, the FAIR principles overlap with open data principles in their emphasis on providing greater access to research outputs. FAIR principles have more of a focus on making outputs interoperable and reusable, even if they are accessible under some restrictions.[11] This is consistent with what the European Council describes as the, "underlying principle for the optimal reuse of research data" which is that the data should be: "as open as possible, as closed as necessary".[12]

Actions to implement FAIR principles and adopt more open practices influence research integrity along a number of pathways. We highlight four areas of change in particular that organisations should respond to in their research strategies.

I Develop and reward skills for FAIR stewardship of outputs

It is important to ensure that researchers have the appropriate mix of skills to help an organisation demonstrate accountability for research integrity. In broad terms researchers need to be aware of research integrity codes of conduct, how to faithfully represent their research in published outputs, and how to demonstrate respect for others and the impacts their research may have on society and the environment. There are also specific areas of overlap between skills for integrity and open science.

The OSPP has recommended that Human Resource Strategy for Researchers (HRS4R) practices, and the forthcoming EC Framework Programme 9 "reflect the principles required to effectively embed a culture of Open Science at the institutional level. These must involve research integrity (including the social, ethical and legal implications), researcher evaluation and the public availability of research outputs."[13] Open science training materials should be readily available for this purpose. The FOSTER library of open science training materials, for example, provides a 'Research Ethics Library' produced by the Norwegian National Research Ethics Committees.[14] The Fit4RRI Project is another essential source of reusable training resources, primarily focused on Responsible Research and Innovation and also addressing its overlaps with Open Science.[15]

There are gaps in other skills that enhance the reliability of research. These include awareness of the FAIR principles, and the ability to apply these to the stewardship of research outputs, a responsibility that researchers share with professional support groups including data managers and librarians. A recent 'State of Open Data' report based on an international survey of researchers found a majority had no awareness of FAIR principles, while only about a third reported their data management practices were compliant with

[11] SPARC Europe (2018) FAIR and Open Data: A Briefing for Policymakers and Senior Managers https://sparceurope.org/download/3585/ p. 2

[12] CEC (2016) Council of the European Union 'The Transition towards an Open Science System - Council Conclusions adopted on 27/05/2016 https://data.consilium.europa.eu/doc/document/ST-9526-2016-INIT/en/pdf, p. 8

[13] European Commission (2018) Integrated advice of the Open Science Policy Platform https://ec.europa.eu/research/openscience/pdf/integrated_advice_opspp_recommendations.pdf#view=fit&pagemode=none, p. 5

[14] The Research Ethics Library, FOSTER: https://www.fosteropenscience.eu/content/research-ethics-library

[15] FIT4RRI: https://fit4rri.eu/

them. There is a large gap in the expertise available to support data stewardship, i.e. the skills to keep data FAIR.[16]

II Provide research data management and scholarly communication services

Reliability is enhanced when research groups formalise their data and software management practices and share outputs more openly. Researchers who do so report improvement in their ability to control data quality, underpinning the publication of more reliable results.[17] Policy makers and research managers aiming to shape their organisation's approach to research integrity can leverage the services their organisation have to support researchers across the data lifecycle, from planning through to data sharing and open access publication. Funding body policies are increasingly moving towards policies on research data that take a holistic view of the research lifecycle and view open data as part of science's self-correction mechanism.[18]

Science Europe, which represents funding organisations across Europe, has signalled the importance of this in its work to harmonise rules on data management throughout Europe. The organisation's guidance offers a set of core requirements for data management plans (DMPs), as well as a list of criteria for the selection of trustworthy repositories where researchers can store their data for sharing. Policy makers in research organisations will find this guidance a useful benchmark for their own policies.[19]

Services to support research data management (RDM) need to engage with all relevant professional support groups. They should encourage research groups to adopt disciplinary standards and embed these in agreed local guidelines. Standards and advice on documenting data collection and analysis steps are especially important. Implementing these will contribute to the *reproducibility* of the research, as well as the FAIRness of research outputs. Funders increasingly expect research organisations to provide support to research staff, as the availability of support increases researchers' propensity to share.[20] Organisations can use the SPARC 'Evaluate your RDM Offering' tool to identify capability areas their RDM service should address and how they may further develop these.[21]

RDM services that are effective in making data FAIR, for example by ensuring data is deposited in public repositories, also contribute to reliability through a *more efficient use of research resources*. Research funders are acutely aware of this. A report commissioned by the EC – *Cost-benefit analysis for FAIR research data* – estimated that the annual cost to the EU of not having FAIR research data is at least €10.2 billion.[22]

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[16] Brock, R. (2019) '"A love letter to your future self": What scientists need to know about FAIR data' (News article, 11 Feb. 2019) Nature Index. https://www.natureindex.com/news-blog/what-scientists-need-to-know-about-fair-data

[17] Knowledge Exchange (2014) Sowing the Seed: Incentives and motivations for sharing research data, a researchers' perspective. http://www.knowledge-exchange.info/event/sowing-the-seed

[18] Whyte, A. and Donnelly, M. (2016) Common directions in research data policy. Digital Curation Centre briefing paper: http://www.dcc.ac.uk/resources/briefing-papers/common-directions-research-data-policy/common-directions-research-data-pol#2 p.1

[19] Science Europe (2018) 'Practical Guide to the International Alignment of Research Data Management' https://www.scienceeurope.org/downloads/

[20] Fecher, B., Friesike, S., & Hebing, M. (2015). What drives academic data sharing? *PLoS ONE*, *10*(2).

[21] SPARC (2018) 'Evaluate your RDM Offering' https://sparceurope.org/evaluate-your-rdm-offering/

[22] European Commission (2019) Cost-benefit analysis for FAIR research data. https://publications.europa.eu/en/publication-detail/-/publication/d375368c-1a0a-11e9-8d04-01aa75ed71a1/language-en p4

Accountability in research integrity terms is enhanced when the path from research concept to publication is more transparent, and the results more accessible. While Open Access to scholarly publications has evolved over a longer period of time and is gaining more momentum with the Plan S initiative, the interlinking of data with research outputs is much less mature. Progress in this area is being advanced by the EU project FREYA for example, building on wider adoption by trustworthy repository services of researcher identifiers (e.g. ORCID) and persistent identifiers for data (e.g. DOIs).[23] New services should be encouraged in this area to interlink persistent identifiers. This will support good research by cultivating good practice in data management, promoting reproducibility, and discouraging plagiarism by making research data results more visible.

III Promotion of Responsible research and Innovation (RRI)

Accountability in research integrity terms includes accountability for the impacts of research. The term 'responsible research and innovation' refers to practices that encourage exploration of these impacts and dialogue within the research fields concerned, and with those affected by or interested in its impacts. The European Commission has a well-established funding programme focussed on RRI since 2014; it is key action of the 'Science with and for Society' objective.[24] One of the Commission's funded, ambitious and useful projects is *RRItools.eu*, that provides access to a broad range of resources to help research groups and organisations take a creative approach to the dialogue. These include online training modules explaining the RRI concept, discussion-based activities, and guidance on using the toolkit to find resources. Train-the-trainer and workshop programmes are also offered, and organisations can adapt these to their own needs.[25]

Managers of research with economic, social or environmental impacts need to ensure RRI. The UK Engineering and Physical Sciences Research Council (EPSRC) exemplifies the strong support for this by specific national funders. Their AREA approach (Anticipate, Reflect, Engage, Act) refers to these key steps verbatum: [26]

- *Anticipate* – describing and analysing the impacts, intended or otherwise, (for example economic, social, environmental) that might arise. The emphasis is not on prediction but rather on supporting an exploration of possible impacts and implications that may otherwise remain uncovered and little discussed.
- *Reflect* – reflecting on the purposes of, motivations for and potential implications of the research, and the associated uncertainties, areas of ignorance, assumptions, framings, questions, dilemmas and social transformations these may bring.
- *Engage* – opening up such visions, impacts and questioning to broader deliberation, dialogue, engagement and debate in an inclusive way.
- *Act* – using these processes to influence the direction and trajectory of the research and innovation process itself.

As the AREA steps suggest, Responsible Research and Innovation principles (like those of Open Science) can be applied to any discipline, and each discipline can and should formulate its own approaches to apply general principles. Consider an excellent example of disciplinary

[23] FREYA project (2018) https://www.project-freya.eu/en

[24] Europa (n.d) Responsible research and innovation https://ec.europa.eu/programmes/horizon2020/en/h2020-section/responsible-research-innovation

[25] RRI tools (n.d) Training modules https://www.rri-tools.eu/training/resources

[26] EPSRC (n.d) Framework for Responsible Innovation, Anticipate, reflect, engage and act (AREA). https://epsrc.ukri.org/research/framework/area

guidelines in the life sciences by the Netherlands Epidemiological Society that translates the broad principles of responsible research into concrete guidelines that follow the steps of an epidemiological study.[27] The MARINA project on the other hand offers a knowledge-sharing platform for marine scientists to involve citizens, policymakers, and industry in formulating environmental guidelines.[28] A common feature of both these examples is an overlap with open science, and sound data management.

IV Establish ethical oversight and impact assessment processes

The ethical oversight of research supports research integrity by ensuring that key principles such as honesty, respect and accountability are respected in the research process, including in open science. Research Ethics Committees (RECs) have become well-established within many European research performing organisations in recent decades, especially universities, driven in part by the needs of health and clinical research to comply with the EU Clinical Trials Directive.[29] As a result, disciplines like health and clinical research, as well as social research, have a stronger focus on ethics than others such as engineering, or earth sciences, where researchers are increasingly encountering ethical issues around the uses of data. But as the previous paragraph illustrated, ethical issues are becoming increasingly cross-disciplinary, hence the need for institutional oversight. Open science amplifies that need for ethical oversight, because it represents a change in research conduct that is itself a response to the spiralling interconnection between science, technology and society. Open Science therefore involves both compliance and cultural issues for research conduct that all research managers need to be aware of and deal with.

The General Data Protection Regulation (GDPR), which came into force in May 2018, is a well-known ethical compliance issue, and the regulation further built on principles that ethical processes are already set up to deal with. The GDPR has led many research organisations to re-examine how well-equipped they are to deal with changes in, for example, informed consent procedures and impact assessments. There is a great deal of guidance available on this, e.g. The European Commission's *Ethics and Data Protection* guidelines, published in November 2018.[30] These guidelines underscore the important point that even where researchers are using anonymised data, which is exempt under the GDPR, the data collection and the research process still may raise ethical issues – highlighting the difference between law and ethics.

Ethical oversight is more than legal compliance - it is an operational response to broader issues of professional concern. University senior managers need to ensure there is effective liaison between Research Ethics Committees and professional services concerned with research governance, for two main reasons. Firstly, the policies, codes and guidelines for Research Integrity and Open Science involve ethical issues and demand local action to ensure good professional conduct. And, secondly, the issues and concerns arise across the disciplines, in any research that has consequences for society. These are issues that

[27] M. Swaen, M. Langendam, J. Weyler, H. Burger, S. Siesling, W.J. Atsmaa, et al. (2018) Responsible Epidemiologic Research practice (RERP). A guideline developed by a working group of the Netherlands Epidemiological.Society. *Journal of Clinical Epidemiology* http://dx.doi.org/10.1016/j.jclinepi.2018.02.010

[28] MARINA (n.d) 'About MARINA' https://www.marinaproject.eu/index.php/about-marina/

[29] Hedgecoe A, Carvalho F, Lobmayer P, et al (2006) *Research ethics committees in Europe: implementing the directive, respecting diversity.* Journal of Medical Ethics 2006; 32: 483-486.

[30] European Commission, 2018, Ethics and data protection. Available at: http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/ethics/h2020_hi_ethics-data-protection_en.pdf

frameworks for RRI (above) help to explore and identify. To enable this response, organisations need to establish a Research Ethics Committee (REC) and assessment framework to ensure a consistent approach and to give researchers, as well as other stakeholders an opportunity to discuss the ethical conduct within research and on its impact.

Current areas of technological innovation, such as Data Science, or Internet of Things, frequently raise concerns about data privacy and surveillance (for example) that Open Science may amplify. Projects in these areas may need oversight of RECs, and research managers may well benefit by carrying out an ethical impact assessment. Standards have recently been developed under the aegis of CEN, the European Committee for Standardisation. The EU FP7-funded project SATORI (Stakeholders Acting Together on the Ethical Impact Assessment of Research and Innovation) developed two CEN Workshop Agreements (CWA), the first part providing recommendations on the 'composition, role, functioning and procedures of ethics committees' and the second part outlining an ethical impact assessment framework for research and innovation in Europe.[31, 32] The CWAs offer an agreed method for ethics and ethical impact assessments of research and innovation, recognising the speed of technological advancement and the ethical questions that arise from it.

4. Help on the horizon - the European Open Science Cloud

The nature and pace of innovation based on scientific research and digital scholarship presents research integrity challenges. Consider for example the complex questions around the acceptability, desirability, and governance of scientific advancement within genetics, artificial intelligence, Internet of Things, and synthetic biology. Cloud-based services are providing a virtual environment for researchers to perform the data-intensive work that is driving many of these innovations. As these services proliferate, they amplify the management challenges for research institutions and infrastructures. Far from being merely technical, the management challenges are fundamentally about research ethics and integrity, as these services drive innovations that are a matter of public concern and wide social impact.

The European Open Science Cloud (EOSC) intends to make a significant difference to organisations' capability to deal with integrity issues. Initiated by the EU in pursuit of its Digital Agenda, the EOSC is establishing a research data ecosystem (or 'system of systems'). This enables data-intensive science and interdisciplinary research by federating access to existing services and infrastructures and making these more interoperable. EOSC should therefore offer research organisations a more level playing field for access to data. Their researchers will be able to access services not previously locally available. Infrastructures and institutions can also benefit from the economies of scale to be gained by offering their locally developed disciplinary expertise to a broader range of research users, via portals and machine-readable catalogues.

[31] CEN Workshop Agreement CWA 17145-1, Ethics assessment for research and innovation – Part 1: Ethics committee. Available at: ftp://ftp.cencenelec.eu/EN/ResearchInnovation/CWA/CWA1714501.pdf

[32] CEN Workshop Agreement (2017) CWA 17145-2, Ethics assessment for research and innovation – Part 2: Ethical impact assessment framework. Available at: ftp://ftp.cencenelec.eu/EN/ResearchInnovation/CWA/CWA17214502.pdf

The EOSC will therefore boost integrity to the extent that it offers more efficient and equitable access to research resources. It will also enhance capabilities in the areas mentioned above as pathways to integrity – skills for research output stewardship, research data management and scholarly communications services, and the governance processes for RRI and its ethical oversight.

Developing skills in output stewardship through EOSC

The EC has identified data stewardship skills as a priority for development of the European Open Science Cloud.[33] Referring to the broad terms of the FAIR principles, these are the skills needed 'to make data FAIR and keep it FAIR', according to the EOSC pilot project, which has developed a skills framework to identify relevant competences.[34] Stewardship skills are needed by researchers themselves, and by the range of professional support services including libraries, IT, and research support services. These skills directly address a number of aspects of good research conduct, including acknowledging and citing the contribution of others, good data management, storage and preservation practices, and compliance with ethical legal and regulatory requirements.

Research data management and scholarly communication services in EOSC

The broad range of services initially defined for delivery via the EOSC includes those needed to gather and organise FAIR research data and data-related research products, and make them available via a service platform. They include: [35]

- Authentication and identification systems, including persistent identifiers and the integration of those for data with other outputs, to better track scholarly communications
- Virtual workspace environments and logbooks to manage research records
- Service information, including policies, compliance and certification frameworks and guidelines
- Catalogues of datasets and data services to support analytics, fusion, mining, and processing
- Services for researchers to make their own data FAIR, including those to store and preserve selected outputs for the long-term

Services in these categories are already widely established but limited to specific domains or constrained by infrastructure. Besides enhancing capabilities and their integration, EOSC will add compliance, certification and governance frameworks.

Ethics and RRI Governance for EOSC

The EOSC will amplify the new sources of ethical issues engendered by the proliferation of data services. An EOSC pilot project white paper on ethics identifies 'data ethics' as a key concern for the EOSC. Data ethics are additional to those conventionally surrounding the organisation of research, personal and sensitive data, and science and society [EOSCpilot]. They include issues associated with the use of drones, social media and ambient computing.

[33] EOSC Declaration (2017) https://ec.europa.eu/research/openscience/pdf/eosc_declaration.pdf, p. 1

[34] EOSCpilot (2018) Skills and Capability Framework https://www.eoscpilot.eu/content/d73-skills-and-capability-framework

[35] European Commission (2018) Implementation Roadmap for the European Open Science Cloud https://ec.europa.eu/research/openscience/pdf/swd_2018_83_f1_staff_working_paper_en.pdf

The European Data Protection Supervisor Opinion 4/2015 gives a good overview of these issues.[36]

Fundamentally for EOSC, the white paper identifies the need to clarify expectations regarding access to different types of data in different domains, and address the potential unintended consequences of aggregating data across federated sets of data generators and repositories. The trustworthiness of these in the EOSC is recognised by the EC as vital to its success. This depends on establishing the policy and governance structures to deal with ethics and RRI. To inform that, the EOSC pilot project white paper on the subject has recommended that:

- EOSC as an organisation should commit to act, and be seen to act, in an ethical manner, with policies and processes that reflect that commitment.
- Structural mechanisms are in place to support research integrity, for instance by establishing metadata systems that ensure accurate provenance data and appropriate acknowledgement of previous work.
- Specialist time-limited working groups are established to propose specific policy responses.
- An Ethical and Legal Advisory Board oversees the work of specialist working groups, and monitors and report on the ethical practices of the EOSC

EOSC governance structures are being established through an EOSC Board and associated working groups. These will emerge in the short term, and their shape will be of interest to all those with a stake in research integrity. In particular, senior managers and policy makers in research performing organisations will be interested in the rules of participation that will apply to services provided by the EOSC, both as users and providers of those services.

5. Conclusion

In conclusion, universities and other research performing organisations need to respond to the challenge of ensuring that researchers know the integrity principles they are expected to apply, and are properly trained to apply them. National and institutional policy makers and research managers have a wide range of opportunities to strengthen good scientific / scholarly practise and research integrity through open science. Now is the time to match strong research integrity policy guidelines with open science ones to apply open science and FAIR data principles for the benefit of research efficiency, trust in research, career advancement and innovation.

SPARC Europe would like to thank DCC for carrying out this work

www.dcc.ac.uk

[36] European Data Protection Supervisor, 2015, Opinion 4/2015, Towards a new digital ethics: Data, dignity and technology. Available at: https://edps.europa.eu/sites/edp/files/publication/15-09-11_data_ethics_en.pdf