

## CESSDA ERIC Agenda 21-24, Tasks 21-22

### Trust Pillar: Task 1 Trust Activities

# D15 Activity report on progress in Trust activities across the SSH domain

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## Executive Summary

This report provides a brief overview of current activities and development of the Trust landscape within the social sciences and humanities domain (SSH).

Trust is an essential part of open science, FAIR<sup>1</sup>, and the European Open Science Cloud (EOSC<sup>2</sup>). This deliverable provides an analysis of the recent developments in Trust activities, focusing on the SSH domain and Europe, that are of interest to CESSDA<sup>3</sup> and its Service Providers<sup>4</sup> (SPs). The report builds on the earlier Trust landscape reports<sup>5,6</sup>, and the topics covered include repository certification, community principles, automated FAIR assessments and metrics, and other Trust-related initiatives, networks and projects within and beyond Europe. The report concludes with a set of recommendations for CESSDA and the Service Providers.

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<sup>1</sup> FAIR = Findable, Accessible, Interoperable, Reusable as defined in Wilkinson et al. (2016)

<sup>2</sup> EOSC Association: <https://www.eosc.eu/>

<sup>3</sup> CESSDA: <https://www.cessda.eu/>

<sup>4</sup> CESSDA Consortium: <https://www.cessda.eu/About/Consortium>

<sup>5</sup> Mari Kleemola, Darren Bell, Recker, Jonas, René van Horik, Jerlehag, Birger, & Maja Dolinar. (2021). D5 One workshop and workshop report presenting the current state of the Trust Landscape and implications for CESSDA Service Providers (Version 1). Zenodo.

<https://doi.org/10.5281/zenodo.4727786>

<sup>6</sup> Dolinar, Maja, Hönegger, Lisa, Čížek, Tomáš, van Horik, René, Kleemola, Mari, Ala-Lahti, Henri, Recker, Jonas, & Kvamme, Trond. (2022). Landscape Workshop and Report (1.0). Zenodo.

<https://doi.org/10.5281/zenodo.5554514>

## Abbreviations and Acronyms

ADP	Slovenian Social Science Data Archives
ARCHIVER	Archiving and Preservation for Research Environments
CDC	CESSDA Data Catalogue
CDSP	Center for Socio-Political Data
CESSDA	Consortium of European Social Science Data Archives
COAR	Confederation of Open Access Repositories
CROSSDA	Croatian Social Science Data Archive
CURE	Curating for reproducibility
DAG	Data Archiving Guide
DANS	Data Archiving and Networked Services
DATICE/SSRI	Icelandic Social Science Data Service / Social Science Research Institute
DMEG	Data Management Expert Guide
DNA	Danish National Archives (formerly DDA)
DICE	Data infrastructure capacity for the European Open Science Cloud
EOSC	European Open Science Cloud
ERIC	European Research Infrastructure Consortium
ESES	Earth, space and environmental sciences
FAIR	Findable, Accessible, Interoperable, Reusable
FAIR-IMPACT	FAIR-IMPACT: Expanding FAIR solutions across EOSC
FAIR4RS	FAIR for Research Software
FSD	Finnish Social Science Data Archive
GESIS	GESIS - Leibniz Institute for the Social Sciences
HRPO	Health research performing organisations
KPI	key performance indicator
LIDA	Lithuanian Data Archive for Social Sciences and Humanities
MES	FAIR Maturity Evaluation Service
MO	Main Office

NSD	Norwegian Centre for Research Data (now <i>Sikt</i> )
NIH	National Institutes of Health
NOSI	Notice of Special Interest
OAIS	Open Archival Information System
ODSS	Office of Data Science Strategy
PID	Persistent identifier
RDA	Research Data Alliance
SASD	Slovak Archive of Social Data
Sikt	Sikt - Norwegian Agency for Shared Services in Education and Research
SND	Swedish National Data Service
SP	Service Provider
SRIA	Strategic Research and Innovation Agenda
SSH	Social sciences and humanities
SSHOC	Social Sciences & Humanities Open Cloud
TDR	Trustworthy digital repository
TF	Task Force
TRUST	Transparency, Responsibility, User focus, Sustainability and Technology
UKDA	UK Data Archive
WDS	World Data System
WG	Working group

## Introduction

Trust is an essential part of open science, FAIR<sup>7</sup>, and the European Open Science Cloud (EOSC<sup>8</sup>). This report provides an update and an overview of the progress in trust-relevant activities and discussions that are of interest to CESSDA and its Service Providers (SPs). The report builds on the previous landscape report by the CESSDA Trust team that summarised the results of the CESSDA Trust Workshop 2021 and described the wider Trust Landscape (Dolinar et al. 2022<sup>9</sup>). This report focuses on recent developments.

The *Turning FAIR into reality* report (2018)<sup>10</sup> remains the baseline for many of the ongoing and new initiatives, and CoreTrustSeal<sup>11</sup> and automated FAIR assessments continue to be topical issues. Rapid developments can be seen in the building of EOSC and within Research Data Alliance (RDA), and several EU funded projects that include trust work have been - or are in the course of being - finalised in 2022.

Whereas the Dolinar et al. report (2022) was both a report on the workshop and the Trust landscape overview, this report only focuses on providing an overview and an update of the Trust activities and the Trust landscape. The workshop will be covered in a separate report that will be submitted at the end of 2022.

This report is part of Sub-tasks 5 and 6 *Alignment with a wider landscape of trust support services* in the CESSDA Agenda 21-22.

## Certification of repositories

### Revisions in the CoreTrustSeal requirements

CESSDA SPs need to adhere to the principles of the Open Archival Information System (OAIS) reference model and acquire the CoreTrustSeal certification. The CoreTrustSeal requirements and supporting guidance are subject to feedback and revision every three years. A revised set of requirements was released in September 2022 and will be in place

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<sup>7</sup> FAIR = Findable, Accessible, Interoperable, Reusable as defined in Wilkinson et al. (2016).

<sup>8</sup> EOSC Association: <https://www.eosc.eu/>

<sup>9</sup> Dolinar, Maja, Hönegger, Lisa, Čížek, Tomáš, van Horik, René, Kleemola, Mari, Ala-Lahti, Henri, Recker, Jonas, & Kvamme, Trond. (2022). Landscape Workshop and Report (1.0). Zenodo. <https://doi.org/10.5281/zenodo.5554514>

<sup>10</sup> Turning FAIR into reality. Final report and action plan from the European Commission expert group on FAIR data. DOI: 10.2777/1524. <https://op.europa.eu/s/skKU>

<sup>11</sup> CoreTrustSeal: <https://www.coretrustseal.org/>

from 2023-2025<sup>12</sup>. The Extended Guidance and Glossary were updated to reflect the changes to the CoreTrustSeal Requirements<sup>13</sup>.

The new requirements include changes to the requirements text and to the general structure of CoreTrustSeal. There are also some simplifications to the compliance levels. Picture 1 provides an overview of changes<sup>14</sup>. The changes are not huge but CESSDA should update support materials accordingly, and the Service Providers should note that preparing for re-certification may take longer than before since the self-assessment texts need to be structured in a new way.

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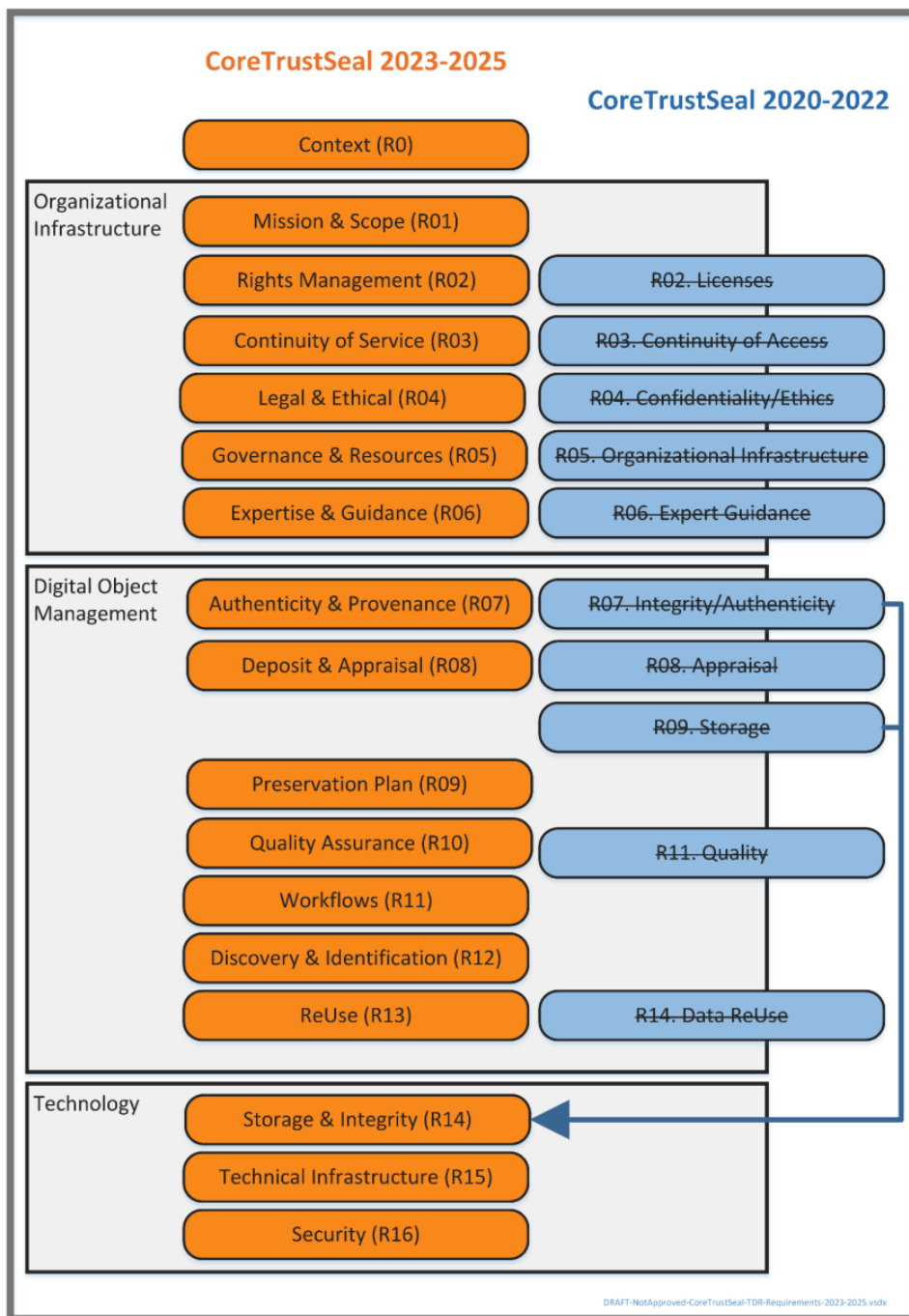
<sup>12</sup> CoreTrustSeal Standards and Certification Board. (2022). CoreTrustSeal Requirements 2023-2025 (V01.00). Zenodo. <https://doi.org/10.5281/zenodo.7051012>

<sup>13</sup> CoreTrustSeal Standards and Certification Board. (2022). CoreTrustSeal Trustworthy Digital Repositories Requirements 2023-2025 Extended Guidance (V01.00). Zenodo. <https://doi.org/10.5281/zenodo.7051096>

CoreTrustSeal Standards and Certification Board. (2022). CoreTrustSeal Trustworthy Data Repositories Requirements: Glossary 2023-2025 (V01.00). Zenodo. <https://doi.org/10.5281/zenodo.7051125>

<sup>14</sup> *ibid.*





Picture 1. Overview of changes to the CoreTrustSeal. Source: CoreTrustSeal Standards and Certification Board. (2022). CoreTrustSeal Revision Working Group Change Log and Associated Materials (v01.00). Zenodo. <https://doi.org/10.5281/zenodo.7051237>

## CoreTrustSeal curation & preservation levels discussion paper

In July 2022 the CoreTrustSeal Board released a discussion paper<sup>15</sup> to gather community input on the definition of curation and preservation levels. This constituted another building block in the effort to better be able to distinguish organisations offering active preservation of digital objects from non-preservation data and metadata services. It can be expected that in the future, to be considered as “in scope” for CoreTrustSeal certification an applicant must demonstrate that at least part of their collection is curated to a minimum level (yet to be defined). The discussion papers propose the following curation and preservation levels:

### **Z. Level Zero. Content distributed as deposited. Unattended deposit-storage-access.**

- Data content and supporting metadata are distributed to users exactly as they are provided by depositors. No curation or long term preservation.

### **C. Basic Compliance and/or curation**

- Data content and supporting metadata deposited are checked at the point of deposit for compliance with defined criteria for data formats and metadata elements. If these criteria are not met the digital objects are returned to the depositor for change, or the repository undertakes the necessary curation steps to ensure they comply. Minimal curation for initial access and use, but no long term preservation.

### **B. Logical-Technical Curation**

- In addition to C above the repository takes long-term responsibility for ensuring that the data and metadata are updated over time to newer standards and formats in response to:
  - technical risks (e.g. file format obsolescence) and/or
  - the changing needs of the designated community (e.g. newer alternate formats become necessary for reuse).

### **A. Conceptual preservation for understanding and reuse**

- In addition to B and C above the repository monitors changes to the definition and demands of their designated community, including their knowledge base, and takes responsibility for the preservation actions that ensure digital objects can be understood and re-used.

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<sup>15</sup> CoreTrustSeal Standards and Certification Board. (2022). Curation & Preservation Levels: CoreTrustSeal Discussion Paper (v01.00). Zenodo. <https://doi.org/10.5281/zenodo.6908019>.

SPs are encouraged to share their comments on and/or approval of these suggestions with the CoreTrustSeal Board via <https://www.coretrustseal.org/contact/>.

## FAIR-enabling repositories

### Key Outputs from the FAIRsFAIR project

CoreTrustSeal certification has traditionally focused on domain/subject-based repositories. However, the overall landscape is wider as discussed in Dolinar et al (2022). Here we focus on recent development regarding FAIR-enabling repositories.

The FAIRsFAIR project<sup>16</sup>, which ended this year, has produced several outputs that are aimed at making repositories 'FAIR-enabling'. There is the FAIR-enabling Data Policy Checklist<sup>17</sup>, which aims at helping users to assess whether specific elements of their data policies are FAIR-enabling, as well as providing recommendations for good practices. There is also the ACME-FAIR 7-part guide<sup>18</sup>, which aims at helping "...managers of Research Data Management and related professional services to self-assess how they are enabling researchers, and the professional staff who support them, to put the FAIR data principles into practice"<sup>19</sup>.

In addition, the project has developed and produced tools and software that are aimed at measuring and improving FAIRness in repositories, like the F-UJI tool<sup>20</sup>, the FAIR-Aware online tool<sup>21</sup>, and the FAIRsFAIR Data Object Assessment Metrics<sup>22</sup>. (See discussion below for more on the F-UJI tool.)

Worth mentioning is also the work on Repository Discovery in DataCite Commons<sup>23</sup>, which have integrated repositories into DataCite Commons, with the aim of supporting researchers

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<sup>16</sup> FAIRsFAIR "Fostering FAIR Data Practices In Europe" received funding from the European Union's Horizon 2020 project call H2020-INFRAEOSC-2018-2020 Grant agreement #831558 Available at: <https://www.fairsfair.eu/>

<sup>17</sup> Davidson, Joy, Grootveld, Marjan, Verburg, Maaïke, van Horik, René, O'Connor, Ryan, Engelhardt, Claudia, Garbuglia, Federica, Vieira, André, Newbold, Elizabeth, Proudman, Vanessa, & Horton, Laurence. (2022). *FAIR-enabling Data Policy Checklist (1.0)*. Zenodo. <https://doi.org/10.5281/zenodo.6225775>

<sup>18</sup> Assessing capability maturity and engagement with FAIR-enabling practice: <https://zenodo.org/communities/acme-fair?page=1&size=20>

<sup>19</sup> Ibid.

<sup>20</sup> <https://www.fairsfair.eu/f-uji-automated-fair-data-assessment-tool>

<sup>21</sup> <https://www.fairsfair.eu/fair-aware>

<sup>22</sup> <https://www.fairsfair.eu/fairsfair-data-object-assessment-metrics-request-comments>

<sup>23</sup> <https://www.fairsfair.eu/repository-discovery-datacite-commons>

in finding a suitable repository and enhancing the discoverability of FAIR-enabling repositories.

FAIRsFAIR have also produced a (draft) Capability Maturity model that aligns the CoreTrustSeal Requirements with the FAIR Data Principles, allowing repositories to self-assess their practice and associated evidence with a view to their development and improvement<sup>24</sup>. As part of EOSC-Nordic, FSD and NSD/Sikt (both CESSDA SPs) have applied, tested and commented on the tabular self-assessment template that has been developed as part of the model. The template is intended to be used by repositories seeking to identify current levels of capability and to plan for increased maturity for their (meta)data services<sup>25</sup>.

The CoreTrustSeal+FAIRenabling Capability Maturity Model could be a useful tool for repositories in measuring or assessing their own level of FAIR-enabling. The template and the model seem to build on some of the work that was done during the development of the CESSDA Capability Development Model in 2020<sup>26</sup> (which never was implemented or further refined), and is as such both a continuation of previous CESSDA work, and a useful starting point for CESSDA SPs and other repositories in thinking about how they fit in with the wider EOSC services and assessing their services accordingly.

As mentioned in the previous Trust Landscape report, trust and FAIR assessment may also be useful in helping to clarify the added value of trustworthy digital repositories offering preservation services for their designated communities in contrast to more technically-driven deposit/storage/access systems that cannot ensure the accessibility and usability of data into the future.

It is still important for CESSDA and its SPs to continue to emphasise the need for deposition of data with a discipline specific trustworthy digital repository, while acknowledging that resources do not permit all data to be curated to this level. The discussion about the role of different types of repositories will continue to be pursued by the CoreTrustSeal Board, e.g. by means of the feedback to the discussion paper mentioned above. In addition, the new CoreTrustSeal Requirements 2023-25 require each applicant to designate themselves as a generalist or specialist repository.

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<sup>24</sup> <https://www.fairsfair.eu/coretrustseal-fairenabling-capability-maturity-model>

<sup>25</sup> Hervé L'Hours, Maaïke Verburg, Jerry de Vries, Linas Cepinskas, Ilona von Stein, Robert Huber, Joy Davidson, Patricia Herterich, & Benjamin Mathers. (2022). Report on a maturity model towards FAIR data in FAIR repositories (D4.6) (V2.0). Zenodo. <https://doi.org/10.5281/zenodo.6699520>

<sup>26</sup> First version: Priddy, Mike, Wittenberg, Marion, & Kvamme, Trond. (2016). CESSDA SaW D3.1: Heuristic Maturity Development Model (1.0). Zenodo. <https://doi.org/10.5281/zenodo.3769496>

CESSDA should keep supporting and contributing to initiatives that aim to design selection and recommendation systems (like re3data.org<sup>27</sup> or FAIRsharing<sup>28</sup>) at the same time as promoting the importance of specialist curation informed by domain expertise to prevent social sciences data ending up in non-expert data curation and preservation infrastructure. Curating and maintaining social science data and making them FAIR in the long term, presupposes specialist archiving systems and procedures. Hence, to ensure trust, the differences in curation responsibility and in the expectations of services provided must be clear to all stakeholders and on all levels, including repositories, reviewers, depositors, users, and funders. The value of data assets is maximised when deposited in domain or subject-based repositories that meet specialist (disciplinary) standards as required by the Designated Community.

## Training on FAIR-enabling organisations

The CESSDA Training team has been working on the Data Archiving Guide (DAG), an online guide inspired by the Data Management Expert Guide (DMEG) but focussed on information for new archive staff. In 2022, the team has been working on a chapter on "FAIR-enabling and Trustworthy Qualities of Data Archives" which introduces the FAIR and TRUST principles, and covers how these principles are reflected within data archives via policies, technology, internal training, and dissemination. The DAG will be officially launched at the end of this year.

## Results from certification support based on CESSDA Trust approach

The CESSDA Trust approach has been validated by being referenced and used by SSHOC<sup>29</sup>, FAIRsFAIR and EOSC Nordic<sup>30</sup> projects. The outputs and key deliverables from FAIRsFAIR have been mentioned above.

A key output from the SSHOC project, concerning Trust and certification, is Deliverable 8.3, "Trustworthy Digital Repository status update and certification solutions for SSHOC repositories"<sup>31</sup>. The deliverable reports on the three primary modes of certification support

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<sup>27</sup> re3data.org <https://www.re3data.org/>

<sup>28</sup> FAIRsharing: <https://fairsharing.org/>

<sup>29</sup> SSHOC, "Social Sciences and Humanities Open Cloud", has received funding from the European Union's Horizon 2020 project call H2020-INFRAEOSC-04-2018, Grant Agreement #823782. Available at: <https://www.sshopencloud.eu>

<sup>30</sup> EOSC-Nordic project has received funding from the European Union's Horizon 2020 research and innovation programme, Grant agreement #857652. Available at: <https://eosc-nordic.eu/>

<sup>31</sup> Mari Kleemola, Henri Ala-Lahti, Tuomas Alaterà, Hervé L'Hours, Benjamin Jacob Mathers, Daan Broeder, René van Horik, Birger Jeriebag, Emiliano Degl'Innocenti, Maurizio Sanesi, & Niko Koski.

that were carried out in the project, namely awareness raising and communication, events, and one-on-one support provided to selected repositories. Of these, the one-on-one support mode was considered to be the most important and effective.

The main mode of one-on-one support provided to the 14 selected repositories, of which four were from social sciences (CDSP, CROSSDA, LiDA, SASD), was reviewing drafts of CoreTrustSeal self-assessments to assist them in identifying gaps in their practices and documentation and help with the process of writing self-assessments and providing appropriate evidence<sup>32</sup>. The supported repositories were at different stages of maturity and organisational practices, and their goals also varied from aligning practices with the CoreTrustSeal requirements to full CoreTrustSeal certification. In the end six out of eight repositories with CoreTrustSeal as their goal did submit or were close to submitting their application.<sup>33</sup>

The SSHOC work also demonstrated the diversity of SSH repositories and even that given the diversity, CoreTrustSeal is suitable for the SSH repositories. All SSH infrastructures at least recommend, if not formally require, CoreTrustSeal certification to their affiliated organisations and most of them do not require or recommend any other certifications. In addition, none of them had plans to require or recommend further certifications or frameworks in the (near) future. The infrastructures' and their members' experiences of utilising the CoreTrustSeal were mainly positive, but some criticism was also mentioned and included the length of the certification (review) procedure, the effort and time that applying for certification takes, and the researchers' and the public's lack of awareness about the CoreTrustSeal.<sup>34</sup>

In the EOSC-Nordic project, as in SSHOC, repositories were encouraged to participate in the support process to the extent relevant to them. In addition to CoreTrustSeal certification support, the EOSC-Nordic project also provided support for adopting a FAIR data standard, or support for *FAIRification*. Two of the supported repositories were from social sciences: LiDA and DATICE. The support levels and modes ranged from basic awareness-raising of good repository practices based on standards to the full CoreTrustSeal plus FAIR approach<sup>35</sup> (through peer support for writing CTS-application plus the FAIR approach as proposed by FAIRsFAIR. See below for more on the *CapMat* model).

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(2022). D8.3 Trustworthy Digital Repository status update and certification solutions for SSHOC repositories. Zenodo. <https://doi.org/10.5281/zenodo.6530203>

<sup>32</sup> Ibid.

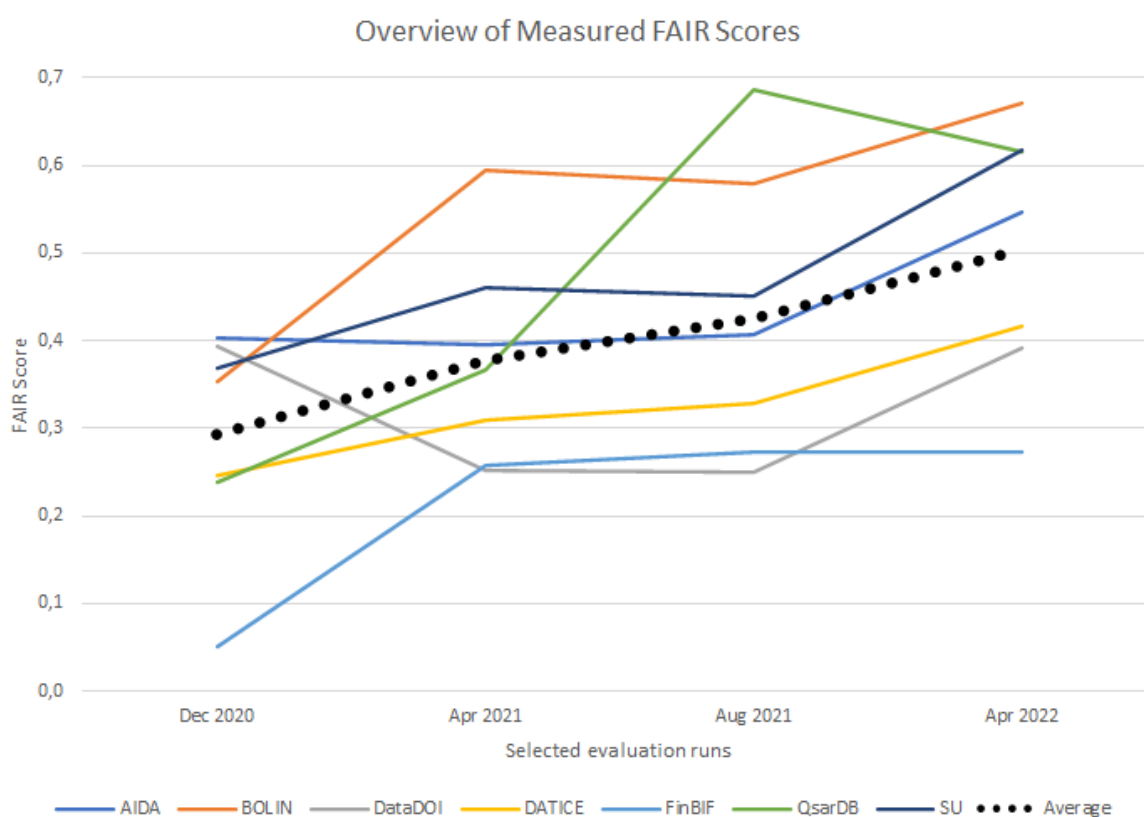
<sup>33</sup> Ibid.

<sup>34</sup> Ibid.

<sup>35</sup> Tuomas J. Alaterä, Mari Kleemola, Henri Ala-Lahti, Birger Jerlehag: D4.5 Report on completed FAIR data standard adoption and certifications of data repositories in the region (to be published).

The results<sup>36,37</sup> of the support process for the 8 repositories that aimed for certification are encouraging: in October 2022, three repositories were ready to submit an application or had submitted, and another three were very close.

Regarding FAIR score development of those repositories which received dedicated FAIRification support, clear improvements were seen, especially when compared to the full sample of repositories that were tested and measured (using the F-UJI tool) during the project. The time invested for those that did work on the improvement of their score, was reported to be fairly moderate<sup>38</sup>.



<sup>36</sup> Tuomas J. Alaterä: Successful support for TDR certification and FAIRification. Presentation held at the EOSC-Nordic Final Event, October 5, 2022, Tallinn, Estonia.

<https://www.eosc-nordic.eu/content/uploads/2022/10/TUOMAS-ALATERA-Successful-support-for-TDR-certification-and-FAIRification.pdf>

<sup>37</sup> Tuomas J. Alaterä, Mari Kleemola, Henri Ala-Lahti, Birger Jerlehag: D4.5 Report on completed FAIR data standard adoption and certifications of data repositories in the region (to be published).

<sup>38</sup> Ibid.

Picture 2. FAIR scores of repositories which received dedicated FAIRification support during the WP4 support programme<sup>39</sup>. Source: Tuomas J. Alaterä, Mari Kleemola, Henri Ala-Lahti, Birger Jerlehag: D4.5 Report on completed FAIR data standard adoption and certifications of data repositories in the region (to be published).

EOSC-Nordic also tested the first version of the *CoreTrustSeal+FAIRenabling CapMat*<sup>40</sup> model that was developed and proposed in the FAIRsFAIR project. The model maps and aligns the CoreTrustSeal Requirements with the FAIR Data Principles to support repository self-assessment of FAIR enabling capability. The capability maturity (CapMat) approach is designed to support self-assessments and the model focuses on the provision of supporting evidence<sup>41</sup>. Using the first version of the CoreTrustSeal+FAIRenabling CapMat model, EOSC Nordic assessed the maturity of the Finnish Social Science Data Archive (FSD) in December 2021. The assessment was completed as an internal review and feedback was provided to the FAIRsFAIR team for further development of the model<sup>42</sup>. Another EOSC Nordic partner, *Sikt*, is in the process of carrying out a CoreTrustSeal+FAIRenabling CapMat assessment, to be finished by the end of November.

The use of CoreTrustSeal+FAIRenabling CapMat assessment proved helpful in identifying gaps and for setting targets for progress. This is an approach that may be relevant and useful for many of the CESSDA archives, both new and established archives.

## Community Principles

### FAIR now and over time

As discussed in our previous report, the FAIR synchronisation force set up during the FAIRsFAIR project<sup>43</sup> was established to maintain a dialogue across the EOSC and FAIR ecosystems and promote adherence to *Turning FAIR into Reality* with the progress being outlined by Grootveld et al. (2021).

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<sup>39</sup> Ibid.

<sup>40</sup> Hervé L'Hours, Maaïke Verburg, Jerry de Vries, Linas Cepinskas, Ilona von Stein, Robert Huber, Joy Davidson, Patricia Herterich, & Benjamin Mathers. (2022). Report on a maturity model towards FAIR data in FAIR repositories (D4.6) (V2.0). Zenodo. <https://doi.org/10.5281/zenodo.6699520>

<sup>41</sup> Ibid.

<sup>42</sup> Tuomas J. Alaterä, Mari Kleemola, Henri Ala-Lahti, Birger Jerlehag: D4.5 Report on completed FAIR data standard adoption and certifications of data repositories in the region (to be published).

<sup>43</sup> FAIR synchronisation force: <https://www.fairsfair.eu/advisory-board/synchronisation-force>



The synchronisation force<sup>44</sup> (SF) is now part of the FAIR-IMPACT<sup>45</sup> project and works as one of three 'coordination mechanisms' that supports the project (the other two being the Technical Bridging Team<sup>46</sup> and a FAIR Implementation Team<sup>47</sup>).

The FAIR-Impact project aims to build on the synchronisation force and plans to maintain and evolve it further. FAIR-Impact initiated an internal cross Work Package team tasked with establishing a dialogue among the various projects, initiatives and actors in both EOSC and FAIR ecosystems. The SF continues to function as a coordination mechanism to engage stakeholders responsible for implementing a FAIR EOSC, ensuring compliance with its Rules of Participation (RoP).

While the FAIR principles are at the heart of data management and open science, they do not specify how digital objects are made FAIR or for how long they should be kept FAIR, and they say nothing about the inevitable changes to the data environment and the users' needs. Keeping data FAIR over time is discussed in the still relevant working paper *FAIR + Time: Preservation for a Designated Community*<sup>48</sup>.

## TRUST Principles

The TRUST principles were introduced in 2020 providing a "common framework to facilitate discussion and implementation of best practice in digital preservation by all stakeholders"<sup>49</sup>. The principles continue to be endorsed by various organisations committed to the stewardship of digital resources and research data in particular, including some CESSDA Service Providers and CoreTrustSeal<sup>50</sup>. It is recommended that CESSDA and its SPs endorse the TRUST principles to emphasise the community's active commitment in promoting and facilitating the preservation and dissemination of social science data by trusted digital repositories.

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<sup>44</sup> FAIR-IMPACT Synchronisation Force: <https://fair-impact.eu/synchronisation-force>

<sup>45</sup> <https://fair-impact.eu/>

<sup>46</sup> FAIR-IMPACT Technical Bridging Team: <https://fair-impact.eu/technical-bridging-team>

<sup>47</sup> FAIR-IMPACT FAIR Implementation Team: <https://fair-impact.eu/fair-implementation-team>

<sup>48</sup> FAIR + Time: Preservation for a Designated Community version 2.0:

<https://doi.org/10.5281/zenodo.5797776>

<sup>49</sup> Lin, D., Crabtree, J., Dillo, I. et al. The TRUST Principles for digital repositories. *Sci Data* 7, 144 (2020). <https://doi.org/10.1038/s41597-020-0486-7>

<sup>50</sup> One can identify the co-signatories and endorse the TRUST Principles at <https://www.rd-alliance.org/trust-principles-rda-community-effort>

## Automated FAIR assessments

The two most adopted automated FAIR assessment methods in recent years have been the FAIR Maturity Evaluation Service<sup>51</sup> (Wilkinson et al. 2019) and the F-UJI Automated FAIR Data Assessment Tool<sup>52</sup> (Devaraju et al. 2020), both of which are still evolving. There is also a growing number of emerging tools. As pointed out by Alaterä et.al. (2022) the same metadata records, assessed by different tools, often get different FAIR scores since the tools tend to interpret the FAIR principles differently. The EOSC FAIR metrics and Data Quality Task Force<sup>53</sup> is trying to address these ambiguities, by assessing the application applicability across research communities and testing a range of tools to enable uptake. The goal of the Task Force is to make recommendations to update metrics and adopt tools as appropriate. Mari Kleemola (FSD) is representing CESSDA ERIC in the Task Force.

Both the F-UJI tool and the FAIR Maturity Evaluation Service are open for anyone to use to test any metadata record. The F-UJI assessment is based on 16 out of 17 core FAIR object assessment metrics developed within FAIRsFAIR and each corresponding to a part or the whole of a FAIR principle<sup>54</sup> (the FAIR Maturity Evaluation Service, in comparison, consists of 22 object assessments). The EOSC-Nordic project has tested a sample of metadata records from Nordic and Baltic repositories using these tools, including several CESSDA SPs and the CDC. Since the end of 2020 the main testing tool used by the project was the F-UJI tool.

Within the FAIR-Impact project<sup>55</sup>, a EU-funded project following the FAIRsFAIR project, work is starting up to extend or adapt current discipline agnostic FAIR-assessment tools like F-UJI to make them more suitable for discipline-specific assessments. CESSDA is one of the use cases within the social sciences that will contribute to the improvements planned within the FAIR-impact project.

## Persistent Identifiers

Persistent identifiers are an essential component of the FAIR ecosystem and developments within the PID landscape continue to improve the PID infrastructure. As discussed in our

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<sup>51</sup> FAIR Maturity Evaluation Service: <https://fairsharing.github.io/FAIR-Evaluator-FrontEnd/>

<sup>52</sup> F-UJI tool: <https://www.f-uji.net/>

<sup>53</sup> <https://www.eosc.eu/advisory-groups/fair-metrics-and-data-quality>

<sup>54</sup> See: <https://www.fairsfair.eu/fairsfair-data-object-assessment-metrics-request-comments>

<sup>55</sup> FAIR-Impact: <https://fair-impact.eu/>

previous report, CESSDA has a PID policy<sup>56</sup> and a PID Checklist<sup>57</sup> and CESSDA and the SPs are well positioned when it comes to PIDs for datasets, while PIDs for other entities are getting more commonly implemented as well.

The FAIR-Impact project that started in 2022 has a work package dedicated to enable and support a sustainable implementation of PIDs in the EOSC providing guidelines and practical support. The PID Forum<sup>58</sup>, hosted by the National Information Standards Organisation (NISO) remains an online space for discussions around PIDs.

## Trust-related initiatives, task forces and projects

### IASSIST

The IASSIST 2022 conference, “Data by Design: Building a Sustainable Data Culture”<sup>59</sup>, was arranged in Gothenburg, 7-10 June 2022. The conference hosted several sessions on Trust and certification. One of the most important was the panel session on trust standards, support and FAIR enabling trustworthy repositories<sup>60</sup>. The session consisted of four presentations followed by Q&A covering the standards and associated mutual support around data management and archiving.

There was also a session by Hervé L'Hours from UKDS, on how CESSDA SPs manage their internal information to demonstrate compliance with a range of standards and certification schemas<sup>61</sup>, and a session by Robert Downs from CIESIN, Columbia University, on how rich data documentation provides opportunities to serve a diversified audience of users and potential users of research data<sup>62</sup>.

### EOSC Task Force on Long Term Data Preservation

The Task Force was established with the aim to “provide recommendations for the EOSC board on the vision and sustainable implementation of long-term data preservation policies

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<sup>56</sup> CESSDA ERIC Persistent Identifier Policy 2019. Principles, Recommendations and Best Practices. Version 2.0. <https://doi.org/10.5281/zenodo.3611327>

<sup>57</sup> CESSDA ERIC Checklist for the Usage of Persistent Identifiers. Version 1.0, 2019. <https://doi.org/10.5281/zenodo.3611333>

<sup>58</sup> PID Forum: <https://www.pidforum.org/>, Twitter: <https://twitter.com/ForumPid>

<sup>59</sup> <https://iassist2022.org/>

<sup>60</sup> IASSIST 2022: *Trust Standards, Support and FAIR Enabling Trustworthy Repositories*

<sup>61</sup> IASSIST 2022: *Information Architecture for Secure Trustworthy Digital Repositories: Quality Culture, not Standards Theater.*

<sup>62</sup> IASSIST 2022: *Documenting Data to Improve Trust and Support Use Across Disciplines and Vocations*

and practices, as well as suggestions to later strategy execution”<sup>63</sup>. CESSDA Trust Working Group Leader Hervé L’Hours is co-chairing the Task Force.

### **Network of FAIR-enabling Trustworthy Digital Repositories**

In August 2022 a Working Paper was released, *Towards a European network of FAIR-enabling Trustworthy Digital Repositories (TDRs)*<sup>64</sup>. The working paper is a bottom-up initiative of a group of stakeholders in the European repository community and was created in close connection with the wider community and building on community-wide feedback. The initiative originates from the January 2022 workshop around the creation of a European network of FAIR-enabling Trustworthy Digital Repositories, where many participants expressed their willingness to join such a network. The published paper will serve as input to the EOSC Task Force on Long Term Digital Preservation.

The working paper puts together a vision of how a TDR-network could be based on the community’s needs and its most important functions: networking and knowledge exchange, stakeholder advocacy and engagement, and coordination and development<sup>65</sup>.

The paper suggests a framework for such a network, which is based on a membership model. The membership structure and financial model is yet to be developed, but the paper states that membership should be open to a range of repository types, from domain or discipline-specific, to institutional, to regional/national, and to generic. Hence, the paper suggests, the business model and governance model of such a network must also be further explored and developed.

### **Research Data Alliance**

Research Data Alliance (RDA) is the main global discussion platform on issues related to open sharing and re-use of research data. The ongoing Working Groups and Interest Groups focusing on FAIRness, trust and/or certification issues are listed below by their status.

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<sup>63</sup> Charter for the EOSC - Task Force - Long Term Data Preservation (EOSC TF LTP). Version 0.5 (08-06-2021):[https://www.eosc.eu/sites/default/files/tfcharters/eosca\\_tflongtermdatapreservation\\_dr\\_aftcharter\\_20210614.pdf](https://www.eosc.eu/sites/default/files/tfcharters/eosca_tflongtermdatapreservation_dr_aftcharter_20210614.pdf).

<sup>64</sup> Philipp Conzett, Ingrid Dillo, Françoise Genova, Natalie Harrower, Vasso Kalaitzi, Mari Kleemola, Amela Kurta, Pedro Principe, Olivier Rouchon, Hannes Thiemann, & Maaïke Verburg. (2022). Towards a European network of FAIR-enabling Trustworthy Digital Repositories (TDRs) - A Working Paper (v2.0). Zenodo. <https://doi.org/10.5281/zenodo.7034315>

<sup>65</sup> Ibid.

#### Working Groups:

- [CoreTrustSeal Maintenance WG](#) (previously named Repository Audit and Certification DSA–WDS Partnership WG). Maintaining deliverables (maintenance group). Key output: [DSA–WDS Partnership Working Group Catalogue of Common Procedures for Certification](#).
- [CURE-FAIR WG](#). Maintaining deliverables (maintenance group). Key output: [10 Things for Curating Reproducible and FAIR Research](#).
- [Data Granularity WG](#). Getting started (~0-6 months after RDA endorsement).
- [FAIR Data Maturity Model WG](#). Maintaining deliverables (maintenance group). Key output: [Member survey on bridging the gap between funders and communities – perspectives on benefits and challenges of FAIR assessments](#).
- [FAIR for Research Software \(FAIR4RS\)](#). Maintaining deliverables (maintenance group). Key output: the [FAIR4RS Principles](#).
- [FAIR for Virtual Research Environments WG](#). Getting started (~0-6 months after RDA endorsement).
- [FAIRsharing Registry: Connecting data policies, standards and databases WG](#). Maintaining deliverables (maintenance group). Key outputs: [FAIRsharing registry](#) and a set of [recommendations](#).
- [Raising FAIRness in health data and health research performing organisations \(HRPOs\) WG](#). Wrapping up (from ~12 months after RDA endorsement).

#### Interest Groups:

- FAIR Digital Object Fabric IG. An essential topic of the IG are FAIR Digital Objects.
- [FAIR for Machine Learning \(FAIR4ML\) IG](#). Not yet endorsed. One of the main objectives of the IG is to build a community of practice for information sharing about ML and FAIR pertaining to ML.
- [FAIR Principles for Research Hardware IG](#). The IG will focus on the unique characteristics of hardware in relation to existing FAIR principles for data and software.
- [GO FAIR Liaison IG](#). Not yet endorsed / In Council review. No information on IG objectives are available or published.

- [RDA/WDS Certification of Digital Repositories IG](#). The IG builds on previous work around certification. It will deliver the global overview and the necessary recommendations and requirements that allow the effective implementation of certification of digital repositories on a national, European, and even global level. Currently (October 2022) the groups have submitted to the RDA a request to form a RDA/WDS Trust Working Group based on this IG. They have submitted a proposal to the AGU fall meeting<sup>66</sup> on the Trust principles and will present this group and their work on Trust principles there.
- [Skills and training curriculums to support FAIR research software IG](#). Not yet endorsed. The IG aims to highlight the work of the [FAIR for Research Software \(FAIR4RS\)](#) WG, and to ensure research software skills are included in ongoing work, to highlight current initiatives in research software training that can provide the basis for skills identification, and to learn from complementary efforts on FAIR data.

RDA and EOSC are cooperating through the EOSC Future Funding Platform through a set of calls. The RDA Open Calls cover eight categories of grants to support the creation of diverse outputs to bring data initiatives and experts closer to EOSC. RDA's role in EOSC is to enable science communities leverage connections to RDA in order to create tools for European research infrastructures, via RDA working groups for EOSC solutions<sup>67</sup>.

One example of an open call is the RDA Open Call for cross disciplinary science adoption grants, which aims to improve the understanding of the requirements per discipline with regards to cross-disciplinary FAIR data sharing and (re)use<sup>68</sup>.

### Trust programs beyond Europe

This section briefly lists developments outside Europe that the CESSDA Trust Group is following as they are larger initiatives whose work is likely to have an impact on the future trust landscape (e.g. the CoreTrustSeal revision of requirements and the development of support structures for certification).

- Canada: Portage Network Data Repository Expert Group<sup>69</sup>

<sup>66</sup> <https://www.agu.org/Fall-Meeting>

<sup>67</sup> EOSC Future Grants: <https://eoscfuture-grants.eu/provider/research-data-alliance>

<sup>68</sup> RDA Open Call for cross disciplinary science adoption grants #2: <https://eoscfuture-grants.eu/provider/research-data-alliance/rda-open-call-cross-disciplinary-science-adoption-grants-2>

<sup>69</sup> Portage network: <https://portagenetwork.ca/network-of-experts/data-repositories-expert-group/>

- Australian Research Data Commons: Trusted Data Repositories Community of Practice<sup>70</sup>
- A repository cohort established in partnership with CoreTrustSeal and the World Data System and supported by the Council of Data Facilities to advance the implementation of FAIR principles in ESES repositories<sup>71</sup>
- The National Institutes of Health's (NIH) Office of Data Science Strategy (ODSS) has announced a *Notice of Special Interest to strengthen NIH-funded biomedical data repositories* to better enable data discoverability, interoperability, and reuse by aligning with the FAIR and TRUST principles and using metrics to measure their effectiveness<sup>72</sup>

### European Research Data Landscape study

The European Research Data Landscape study aims to provide a detailed characterisation of the European research data ecosystem and was carried out in 2022 by Visionary Analytics (VA), the European Future Innovation System Centre (EFIS), Digital Curation Centre (DCC), Data Archiving and Networked Services (DANS)<sup>73</sup>.

The findings and recommendations of the study have not been published at the time of writing this report, however the authors of this report have participated in several conferences where its initial findings have been presented (e.g. Slovenian Open Science Day<sup>74</sup>, EOSC-Nordic final event<sup>75</sup>). From the presentations of the study results it was noted that research data repositories were not the most common destinations for storing usable research data, as around 60% of researchers still store their data locally. Two thirds of the respondents do have some familiarity with the FAIR principles, they do develop data management plans, however other FAIR-aligned practices are less common, with allocating

<sup>70</sup> Australian Research Data Commons:

<https://ardc.edu.au/news/call-for-expressions-of-interest-trusted-data-repositories-community-of-practice/>

<sup>71</sup> Enabling FAIR Data project:

<https://eos.org/agu-news/advancing-fair-data-in-earth-space-and-environmental-science>

<sup>72</sup> NOSI to Support FAIR Biomedical Repositories:

<https://datascience.nih.gov/data-ecosystem/support-fair-biomedical-repositories>

<sup>73</sup> The European Research Data Landscape:

<https://www.efiscentre.eu/projects/european-research-data-landscape/>

<sup>74</sup> Open Science Day 2022, Slovenia:

<https://odprtaznanost.si/nekategorizirano/open-science-day-2022/>

<sup>75</sup> Michael Arentoft: The EOSC tripartite collaboration. Presentation at EOSC-Nordic final conference, Tallinn, 5th October 2022.

<https://www.eosc-nordic.eu/content/uploads/2022/10/MICHAEL-ARENTOFT-The-EOSC-Tripartite-Collaboration.pdf>

PIDs to be the least common practice. According to the presentations, the biggest barriers to sharing data are time, effort and financial costs required for research data management and data sharing, data protection and legal restrictions, and lack of recognition.

## **EOSC Symposium 2022**

The EOSC Symposium<sup>76</sup> is the main EOSC annual event and takes place in Prague, Czech Republic, from 14th-17th November 2022 as part of the calendar of events of the Czech presidency of the Council of the EU. The symposium will be held in conjunction with the Second EOSC Tripartite Event (15th November) and aims to bring together actors from across the EOSC ecosystem to present and share updates. At the time of writing, only a draft programme is available, but topics include e.g. FAIR and long-term preservation.

## **Other relevant projects and initiatives**

The DICE project<sup>77</sup> is a follow-up of EOSC-hub and builds infrastructure for EOSC. DICE offers a set of digital data storage services that are available for free for researchers in the EU research community<sup>78</sup>. The services offered include the EUDAT services complemented with additional “add-on” services. Access to these services are granted through a “call-for-service” request that can be submitted through the EOSC Portal. The DICE Data Storage Service sort their storage services in five categories: Personal/project workspaces (B2DROP); Data archives; Policy-based data archives (B2SAFE); Data repositories (B2SHARE); and Data discovery (B2FIND). B2FIND is harvesting metadata from the CESSDA Data Catalogue since October 2022.

The ARCHIVER project<sup>79</sup> aims at introducing improvements in the area of archiving and digital preservation services, supporting the IT requirements of European scientists and providing end-to-end archival and preservation services. The ARCHIVER Long-Term Data preservation solutions are available through the EOSC portal and on stand-alone webpages:

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<sup>76</sup> EOSC Portal: <https://eosc-portal.eu/events/eosc-symposium-2022>

<sup>77</sup> DICE project: <https://www.dice-eosc.eu/>

<sup>78</sup> DICE - Call for Service Requests: <https://www.dice-eosc.eu/call-service-requests>. Note that the services are free only until June 2023; after June 2023, providers will “...continue to offer their services as part of their mission, under appropriately agreed conditions of use”.

<sup>79</sup> ARCHIVER project: <https://www.archiver-project.eu/>



the LIBNOVA LABDRIVE Research Data Management and Digital Preservation platform<sup>80</sup>, and Arkivum Digital Archiving and Preservation Solution<sup>81</sup>.

The Dutch Certification Signpost<sup>82</sup> (in Dutch only) provides guidance for repositories seeking certification in the field of digital preservation.

Preservica<sup>83</sup> presents itself as a “cloud hosted and on-premise active digital preservation software” that is “...trusted by a rapidly growing customer base of organizations across the globe”, some of which include HSBC, AP, BT, Yale, MoMA, 19 US state archives and 15 national and pan-national archives<sup>84</sup>. The services they offer claim OAI compliance and include tools for content and metadata management, storage and deployment, content acquisition, access and discovery, and security/access administration<sup>85</sup>.

As mentioned above, FAIR-Impact is an EU-project following the FAIRsFAIR project. FAIR-Impact aims to support the implementation of FAIR-enabling practices, tools and services across scientific communities at a European, national and institutional level and for instance includes work around FAIR assessment tools and persistent identifiers. In contrast to the FAIRsFAIR project which mainly provided domain-agnostic guidance, FAIR-Impact explicitly wants to target problems arising in the different scientific domains.

The FAIR-Impact project aims to build on the synchronisation force (see above) and plans to maintain and evolve it further. FAIR-Impact initiated an internal cross Work Package team tasked with establishing a dialogue among the various projects, initiatives and actors in both EOSC and FAIR ecosystems. The SF continues to function as a coordination mechanism to engage stakeholders responsible for implementing a FAIR EOSC, ensuring compliance with its Rules of Participation (RoP).

## Conclusion and recommendations for CESSDA and the Service Providers

CoreTrustSeal, implementation of the FAIR principles, automated FAIR assessments, and building a network of FAIR-enabling TDRs continue to be topical issues. Actions and developments within these areas can be seen in EOSC, RDA, FAIR-IMPACT and other initiatives and projects mentioned in this report.

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<sup>80</sup> Libnova: <https://www.libnova.com/>

<sup>81</sup> Arkivum: <https://arkivum.com/data-archiving/scientific-research/>

<sup>82</sup> De Wegwijzer Certificering voor Digitale Archieven: <https://wegwijzercertificering.nl/nl>

<sup>83</sup> Preservica: <https://preservica.com/>

<sup>84</sup> <https://preservica.com/about>

<sup>85</sup> <https://preservica.com/digital-archive-software-1>

Trust and FAIR assessment continue to be useful in helping to clarify the added value of trustworthy digital repositories offering preservation services for their designated communities in contrast to more technically-driven repository systems that cannot guarantee the accessibility and usability of data in the long term.

In addition to making digital objects FAIR, it is essential that they are kept FAIR in the long term. The added value of a trustworthy digital repository is the key role they play in enabling data to become and remain FAIR over time. This is a task that continues to require domain specific expertise.

CESSDA needs to continue to closely monitor the evolution of the trust landscape, especially in the context of EOSC but also globally. CESSDA is well connected and well positioned to have an impact in the future developments of the trust landscape.

Based on the landscape analysis, the CESSDA Trust Group has renewed and updated the set of recommendations for CESSDA that was formulated in the previous Trust landscape report. The recommendations are listed in Appendix 1 and they are grouped by the stakeholder who would have the responsibility to take initiative or coordinate actions related to the recommendation. These recommendations will be further amended based on the Trust Workshop discussions in December.

## Appendix 1 - Recommendations for CESSDA and the SPs

	<b>Recommendation</b>	<b>Action/ initiative</b>
1	Closely follow the discussions accompanying the building of EOSC. Keep updated on work and outputs coming out of RDA. This will enable CESSDA to react adequately to relevant Trust-related developments within these networks.	MO
2	Follow up on relevant outcomes from projects like SSHOC, FAIRsFAIR, FAIR-Impact and EOSC Nordic and integrate where appropriate to enable CESSDA to take advantage of synergies from common SSH practices.	MO
3	Aim at playing a key role in providing certification and FAIR support service for SSH communities and also more widely.	MO
4	Support work to identify different types of repositories and efforts to design selection/recommendation systems (like re3data.org or FAIRsharing).	MO
5	Participate in shaping the (SSH) standards used in automated FAIR assessment tools.	MO
6	Explore the development of routines and policies enabling the assignment of PIDs not only on dataset or study level, but also to authors, contributors and funders, and to parts of studies.	MO
7	Endorse the TRUST principles.	MO and SPs
8	Emphasise the need for domain/subject-based curation and deposition of data with a discipline specific TDR.	MO and SPs
9	Include more machine-understandable metadata in the catalogues.	MO and SPs

## Appendix 2 - References related to the Trust landscape

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