

Because Data Shall Grow (and so shall we)

Steps Towards a Cultural Change for Sharing Research Data

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Abstract. Research data are a valuable asset of their own and individual researchers as well as the research community as a whole can benefit from data sharing practices. These benefits include but are not limited to higher data quality or the more efficient use of resources. Despite these potential gains, data sharing is not widespread yet and processes of cultural change are needed to reap the benefits of data sharing. A transition to FAIR and open data sharing can only be sustainable if it permeates all aspects of academia. Therefore, this transition takes time and must start as early as possible. In 2023, the NFDI is complete in its first incarnation with 26 funded consortia and the funded association of consortia, Base4NFDI, and can function as a platform for discussion and collaboration around cultural change. The NFDI provides a network that extends beyond individual research bubbles in the name of common interests and facilitates cultural change processes towards data sharing. We identified four central clusters of interest including 1. policies, strategies, and funding; 2. communities, workshops, and multipliers; 3. publications, and 4. collaboration, communication, and error cultures. To deepen our understanding of ongoing cultural change, a scheme for collecting use cases has been developed and an analysis of these use cases will be published to summarize learnings for the NFDI on how to encourage cultural change.

Keywords: Cultural Change, Data Sharing, FAIR Principles, NFDI

1. Research Data as a Resource for an Innovation Driven Society

Data seen as a resource is of a completely new type: unlike gold, shared data is not lost; its worth is increasing by connecting it to other resources and allowing for new uses. Unlike oil, data cannot be depleted by sharing. A society that commits to sharing research data openly is choosing a beneficial strategy.

1.1 The NFDI's Role and Purpose in this Process

Cultural change in research is primarily about designing and enabling collective and collaborative practices, e.g., quality standards or evaluation and funding criteria, that are followed and embraced by entire communities. It is grounded in a set of shared values and a common understanding that FAIRness [FAIR] and openness are more relevant than currently prevailing means to define impact and value. Cultural change needs to involve all parts of the common infrastructure, so that systems designs – hardware, software, standards, rules, guidelines – furthers the new collaborative and collective culture. This new culture has to spread widely to be sustainable and effective and must transcend the borders of institutions and disciplines. The NFDI consortia are designed to develop and promote a culture of data sharing [BLV] but jointly they can support a more far-reaching cultural change than individual research communities. The NFDI provides a common ground for discussion and negotiation, is a stable base with sustainable infrastructures, and has a broad reach to sustain cultural change. In 2023, the NFDI is complete in its first incarnation with 26 funded consortia and the funded association of consortia, Base4NFDI, and therefore the basis for driving transdisciplinary cultural change processes within the context of the NFDI is given.

1.2 Data as Humus – the CC-BY-US Series

But what should we compare data to, if not to “Gold” or “Oil”? An interesting metaphor could be “humus”. In a shared information infrastructure, a project can grow on FAIRly shared data. “Data” would thus be seen and framed as a force or an element of a shared ecology. The “CC-BY-US” series of collaborative workshops on cultural change in the NFDI will thereby promote ecological growth. Nothing needs to be thrown away in the collective information infrastructure. Instead, the research data of today will be the humus for the ideas and innovation of tomorrow. The individual contribution is made with a sense of purpose towards the future generations of “growers” of research, restraining oneself from the need of individual and immediate benefits towards a more sustainable NFDI.

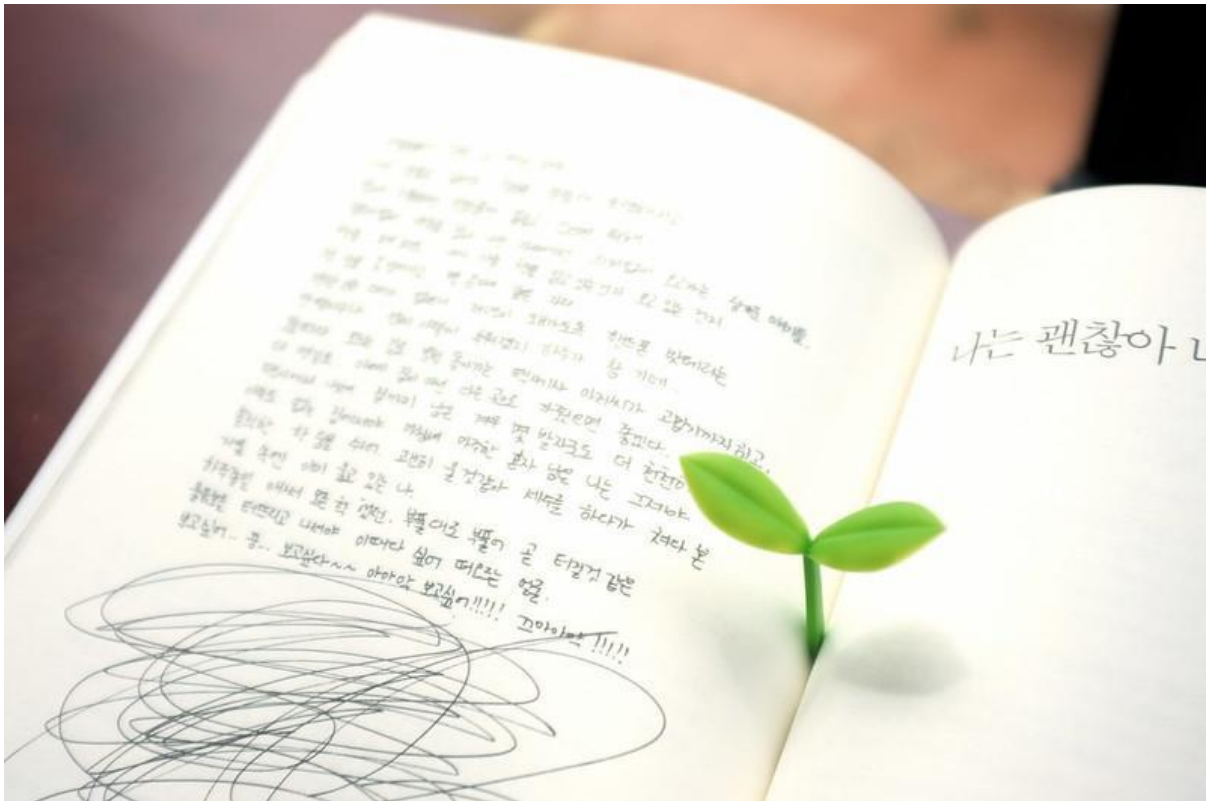


Figure 1: Data is humus. It helps research grow. Source: flickr.com, k.o.u - [Sprout!](#) (CC-BY 2.0)

2. Fields of Action: Fertilizing Growth of FAIR Data

In a first workshop “CC-BY-US: Cultural change in sharing research data with and through the NFDI” [CCBYUS1] participants from across the NFDI identified four main clusters of interest and focused on explicating some basic opportunities for collaboration and examples of best practice. The event also identified old habits to overcome and general threats to the endeavor. These clusters are:

- Policies, strategies, and funding (e.g., data stewardship [TUDelft]; including limitations [DSSS] [TW])
- Communities (e.g., pledges [N4E], considering target groups), multipliers, workshops, and surveys (e.g., [FDM])
- publications (e.g., contribution statements [CRedit])
- collaboration, communication, and error culture

A second workshop “CC-BY-US 2: How can cultural change promote the use of infrastructures; how do infrastructures promote cultural change?” [CCBYUS2] aimed at understanding the dimensions of cultural change, sharing learnings for challenges, and classifying repercussions on infrastructures. To do so, we discussed case studies to identify conditions of successful cultural change, the role of infrastructures as enablers of cultural change, and developments that promoted or hindered the use of infrastructures for cultural change. Different case studies from health sciences, art history, zoology, astrophysics, and psychology were discussed along a set of questions. Based on these cases we observed conditions for success: The technological possibilities were welcomed by local staff, grounded in already established practices, furthered by management, and continued by permanent academic staff.

2.1 A Scheme for Collecting Use Cases in Cultural Change

Based on these workshops we have developed a scheme for collecting and describing use cases of cultural change. This scheme has been tested during our second workshop, in which we focused on the tangible feedback of infrastructures and the actors, practices, and processes involved in cultural change. If you have a use case, we would be happy if you would share it with us. You can find printed forms at our poster at the conference, or you can follow this QR code to an online form at <https://cloud.nfdi4culture.de/apps/forms/s/Ej4gLA6zZ8boqtn5g9fTaGPa>.



Figure 2: QR code to our digital form for collecting use cases (<https://cloud.nfdi4culture.de/apps/forms/s/Ej4gLA6zZ8boqtn5g9fTaGPa>)

3. The Way Ahead

The initial workshops revealed that the differences between research communities are often less pronounced than the differences between individual scientists. Therefore, the collection of use cases of cultural change from communities provides a basis to develop learnings for all NFDI consortia and derive approaches to initiate cultural change processes. The learnings from our use cases will be discussed during a final workshop in Duisburg in November 2023 and published as a white paper at the end of the year.

Data availability statement

not applicable.

Underlying and related material

not applicable.

Author contributions

Julia Rakers, Bernhard Miller, Julia Mohrbacher, Daniel Nüst, Torsten Schrade, Jörg Seegert, and Christian Vater have contributed to **writing this contribution**, Holger Simon, and Cord Wiljes have contributed by **conceptualizing and/or editing**.

Competing interests

The authors declare no competing interests.

Funding

This contribution is funded by DFG through various grants:

KonsortSWD – grant no. 442494171

NFDI4Culture – grant no. 441958017

NFDI4Earth – grant no. 460036893

NFDI-MatWerk – grant no. 460247524

Acknowledgement

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