

Berlin Declaration on NFDI Cross-Cutting Topics

as agreed on 15.08.2019 by the following NFDI consortia:

NFDI4BioDiversity - Biodiversity, Ecology & Environmental Data

NFDI4Earth - NFDI Consortium Earth System Science

KonsortSWD - Consortium for the Social, Behavioural, Educational, and Economic Sciences

NFDI4Chem - Fachkonsortium Chemie für die Nationale Forschungsdateninfrastruktur

NFDI4Health - National Research Data Infrastructure for Personal Health Data

NFDI4Agri - NFDI for Agricultural Sciences

NFDI4Crime - National Research Data Infrastructure for Crime

NFDI4Medicine - NFDI Consortium of the Medical Informatics Initiative (MII) and the German Centers for Health Research (DZG)

DataPLANT - Data in PLANT research

GHGA - German Human Genome-Phenome Archive

Astro-NFDI - Astronomy, Astrophysics, and Astroparticle Physics within the National Research Data Infrastructure

This declaration is supported by the following consortia:

Forum X - An open forum on experiments across the disciplines

PAHN-PaN - Particle, Astroparticle and Hadron & Nuclear Physics Accelerate the NFDI

DAPHNE - Data for Photon and Neutron Experiments

BERD@NFDI - Business, Economic and Related Data at NFDI

NFDI4CAT - NFDI for Catalysis-Related Sciences

NFDI4MSE - NFDI for Material Sciences and Engineering

Text+ - Language- and Text-Based Research Data Infrastructure

NFDI4Culture - Consortium for research data on material and immaterial cultural heritage

NFDI4Ing - National Research Data Infrastructure for Engineering Science

NFDI4MobilTech - National Research Data Infrastructure for Mobility Technology

Declaration

In the spirit of our common interest to build what could become an international beacon for sharing the benefits of high-quality research data and research data management, the signing NFDI consortia strongly support the idea that NFDI must build on a coordinated and inclusive effort fostering the FAIR data principles. Recalling the challenges that interoperability and sharing of data faces, the consortia agreed on the following common list of cross-cutting topics:

Collaborative governance and general framework:

- Common vision of the NFDI, long-term foresight and common strategic planning
- Governance & sustainability
- Cultural change aka reputation, publication/funding policies and credit systems
- Policy advice, consultation and outreach with respect to NFDI
- International visibility and networking of NFDI
- Human resource management, recruitment, development

Community (User) involvement:

- User driven adaptive development of NFDI (cross-domain use cases)
- Training, undergraduate and graduate education, professional development
- Stimulating a cultural change of users and providers towards FAIR and open research data

Technical infrastructure and concepts:

- Research data commons - incl. cloud infrastructures, computing power, Identity and Access Management (IAM) and interfaces between data providers and users across domains
- Standardization/harmonisation
 - Terminologies, terminology management and services
 - (Meta)data harmonisation, findability
 - Provenance
 - Interoperability across domains
 - Common data and metadata standards and encodings (e.g. NFDI core metadata)
 - Persistent unique identifier systems

- Infrastructures
- Quality management and assurance - incl. certification of services (data, software and service quality criteria, evaluation and qualification criteria, qualification and/or certification processes for NFDI service offerings)
- Scalability of tools and services

Legal and ethical aspects

- Legal aspects (licensing, intellectual property rights and data protection & privacy)
- Commercial use of data (commercialisation of data)
- Ethical aspects of sharing research data and research software
- Ethical-legal aspects of managing person-related data for research

The common vision of the 11 NFDI consortia who met in Berlin and the 10 supporting NFDIs

All consortia present at the Berlin meeting and the supporting NFDIs agreed that strong cooperation and communication among NFDI consortia is essential for building a meaningful research data infrastructure for Germany in an international context. The above list of cross-cutting topics was assembled with the understanding that:

1. this list is not comprehensive and there will be additional cross-cutting topics brought forward by additional communities
2. it is necessary to better define the relation between the (funded) NFDI consortia and the NFDI directorate in particular with respect to governance and the general framework issues
3. all of the listed topics are relevant for NFDI, but not every topic has the same relevance for each consortium
4. cross-cutting topics shall be addressed by several consortia in **inter-consortium working groups**. Leadership of such working groups needs to be organized, but can only be defined after funding decisions have been made
5. there should be no claim of leadership in any consortium proposal; instead each consortium shall indicate which topics are of particular relevance for their community
6. after a successful application all consortia signing this declaration shall work collaboratively on the cross-cutting topics

Collaborative governance and general framework topics:

Clear governance structures are a key prerequisite to ensure sustainable operations of a distributed infrastructure like NFDI. Therefore, a major challenge for NFDI and/or the NFDI consortia and directorate will be the identification of an appropriate **legal entity** which serves the interests of the consortia and service providing host institutions. Discussions are needed about sustainability, operating, cost-covering and legal models for the coordination bodies/offices of the NFDI and the NFDI consortia.

The NFDI as a whole will work to ensure a **cultural change** so that open and FAIR data contributions are recognized at a similar level than peer-reviewed publications and conference contributions. This involves the design of new reputation schemes, publication and funding policies, and academic credit systems. The consortia recognize that they will need to engage with policy makers and contribute to NFDI outreach. Working together, they see great potential to strengthen Germany's role and visibility in the international context of research data management. To increase the attraction of skilled data professionals, collaborations on human resource management, recruitment and staff development will be considered.

Community (User) involvement topics:

The consortia recognize the need to establish cross-domain use cases to foster the user driven **adaptive development of NFDI** and overcome traditional domain barriers. There is a common understanding of cross-cutting training platforms, methods, tools, and content which can lead to synergies and cost savings. However, community-specific approaches must remain possible and community-specific content will often be developed independently of other consortia.

Technical infrastructure and concepts topics:

Research data management inevitably has implications on a rich set of topics concerning technological implementations and (computer science) concepts. To allow for cross-disciplinary access and reuse of research data within the NFDI, some level of standardisation and harmonisation is required for several metadata and data properties. Several consortia share the view of a **Research Data Commons (RDC)** as an overarching virtual expandable infrastructure to leverage user involvement and collaborative data driven research. This includes for example joint cloud services, access to computing power and collaborative workspaces, and a common authentication and authorisation infrastructure (AAI). The RDC calls for a common strategy for interacting with the existing large-scale compute and data infrastructures in Germany and the need for harmonisation among these centers.

Developing common views about the **quality assurance** of NFDI repositories and services (and the data provided by them) is another important cross-cutting topic, which will also be of relevance for the NFDI governance, the necessary cultural change, and the user engagement.

Legal and ethical aspects

Legal aspects such as **licensing, intellectual property rights, data protection and privacy** are of utmost importance for communities dealing with sensitive data, but they cannot be ignored by other communities either. The same holds for **ethical aspects**. All these topics would greatly benefit from a consolidated approach of the data users and data providers within NFDI. Likewise, as with many other cross-cutting NFDI topics, most legal and ethical aspects need also to be considered in the international context: research data often stems from international collaborations or is shared with international colleagues. A specific concern with relevance for the development of a sustained NFDI governance is to clarify parameters for the commercial use of data and the potential commercialisation of data.

Person-related data to be used for research adds particular challenges, both on the ethical and legal side. The special protection this type of data requires to maintain a person's privacy and to fulfil the strict legal requirements imply a larger effort on the technical side in order to ensure proper data protection, but also requires ethical considerations as well as a legal framework providing transparency and legal certainty on the use of the data for both data providers and data users.

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