



# **The development of the National Research Data Infrastructure (NFDI)**

Second statement of the NFDI Expert Committee

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**Deutsche Forschungsgemeinschaft**

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The NFDI is structured as a network of consortia that act on their own initiative in a science-driven process. The subject-oriented profile and content focus of a consortium are the result of an intensive discussion process between those responsible for the consortium and the disciplinary communities being addressed. It is of particular importance for the success of the NFDI as a whole that there is adequate subject-specific coverage of the scientific fields after three selection rounds, and that there is active cooperation between the individual consortia. When the consortia network with each other in cooperation with the Directorate and work on cross-cutting topics in a coordinated, collaborative way, they play an active role in ensuring that the NFDI is more than the sum of its parts; in other words, more than the individual consortia.

The National Research Data Infrastructure has the potential and the goal of becoming a central research data management structure, both nationally and internationally. In order to achieve this, the NFDI must again be more than the sum of its parts by expanding its perspective beyond the needs and interests of the consortia supported with funds from the NFDI funding programme. When it works well, the NFDI in the narrower sense is a stimulus for the way that research data are handled in the sciences, and comprises far more than the activities and services of the consortia that are financed by the NFDI funds. Since developments such as these extend beyond the NFDI, they can no longer be covered and financed by the NFDI alone. Complementary programmes and funding options are needed in order to support the development of the NFDI and to be able to respond appropriately to the dynamic processes in the field of research data management. To this extent, the NFDI will and must be open to and compatible with complementary developments that are funded from different sources.

These assumptions entail challenges for the further development of the National Research Data Infrastructure and the tasks of the NFDI Expert Committee, which will be outlined below.

### *1. Grant levels*

The first selection round demonstrated that the ability to fund all the needs stipulated in the reviewed consortia through the NFDI funding programme is clearly reaching its limit. For NFDI development, around 70 million euros per year are available for direct project costs during the expansion stage. Taking 30 funded projects as a basis, this means that on average, 2.32 million euros are available per year for each consortium. During the first round of calls for tender, the volume applied for by each consortium was 3.5 million euros per year. In light of the development of the NFDI over the course of three rounds, from the perspective of the NFDI Expert

Committee, it is essential to ensure that consortia funded in the third round have the same opportunity to obtain funds as the consortia in the first round. In order to maintain this equality of opportunity, it was necessary to make major cuts, since the programme was significantly overbooked. The NFDI Expert Committee is aware that these cuts, some of which are considerable, present the consortia with difficult challenges.

With a view to the necessary cuts, the NFDI Expert Committee discussed a general calculation or curtailment mechanism for all consortia, which is to be applied in all three rounds. This mechanism has been taken as a basis in the same way each time the level of funding to be awarded to each consortium was decided. In light of the funds available, the requirement specified by the NFDI Expert Committee, that the same opportunities for receiving funding should be guaranteed in all three rounds, together with the highly likely prospect that the full 30 consortia will be funded, cuts will also be unavoidable in the forthcoming two rounds if the average volume for which applications are made significantly exceeds the average funding volume.

## *2. The profile of consortia and the coverage of scientific fields in the NFDI*

The goal of the development of the NFDI is to provide appropriate representation of all scientific fields through funded consortia in the NFDI following three selection rounds. It is a key feature of the NFDI that there is no pre-defined blueprint, which determines from the top down which subject areas should be represented in the NFDI. Rather, the structure of the NFDI is a component and a result of the science-led procedure. The formation of the consortia, including their subject-oriented profile, is completed during a process that is driven by the communities themselves. The structure of the NFDI, both with regard to the profile of the individual consortia and the overall structure of the NFDI, particularly the scientific fields covered, is therefore the direct result of the consortia proposals submitted over the course of all three rounds. It is the task of the review and assessment process to evaluate the quality of the subject-oriented structure of the NFDI that arises from the proposals. The reference point in order to be able to ascertain whether or not subject fields are adequately covered is therefore not the entirety of all scientific disciplines. Rather, this reference point is the consortia initiatives in total, which are the result of an intensive communication process in the respective communities. Accordingly, gaps in subject fields can arise when consortia that are proposed for which funding would be desirable within the framework of the NFDI cannot be financed due to a lack of funds available, or do not meet the quality standards of the review process and assessment.

While the profile of consortia may differ – without being able to tie up considerably more resources than can be made available in light of the existing overall budget, the benchmark number of 30 consortia and the average level of funding provided – a decision regarding the funding of consortia must be made according to the same criteria. Here, the subject-specific quality of a consortium, its acceptance in the community and the quality of the measures with which the necessary loop back to the community is guaranteed are the aspects that take highest priority when assessing eligibility for funding. An explicit and earnest exchange between those who offer and operate research data management services and the users of these services is essential for the success of a consortium and thus of the NFDI overall.

The task of the NFDI Expert Committee is to assess the recommended structure for the NFDI formulated by the applications – both with a view to the consortia and the overall structure – on the basis of the results of the review process. With its recommendations for funding, the NFDI Expert Committee helps to ensure that the NFDI is both structured in an evolutionary process in a way that comes closest to meeting the needs formulated by the applications, while also being supported by consortia that meet the qualitative funding requirements.

### *3. Networking*

The NFDI will develop its full effectiveness when it becomes possible for the NFDI to grow as a networked structure. Networking is important on at least three levels: first, with a view to the division of labour and possible synergy effects; second, with a view to the ability of the consortia to integrate into the NFDI and in so doing, to develop the NFDI as an interacting system; and third, with a view to networking with other research data management structures that are not necessarily covered by the NFDI funds.

A prerequisite for successful networking on all three levels is the coordinated, shared processing of cross-cutting topics.

With its statement of 2019, the NFDI Expert Committee emphasised the importance of cross-cutting topics, referring to the fact that on the one hand, productive work requires a solid subject-oriented base within the consortia themselves, while on the other, working on cross-cutting topics for the NFDI creates essential cross-connections between the consortia. Collaborating on cross-cutting topics is an inherent component of the development process of the NFDI as a whole, and of the development process of each individual consortium. When it comes to networking between the consortia, cross-cutting topics are therefore the subject and the impulse generator at the same time.

In the ongoing discussion process on cross-cutting topics – and one which, as evidenced by the “Berlin Declaration on NFDI Cross-Cutting Topics” and the “Leipzig-Berlin Declaration on NFDI Cross-Cutting Topics on Infrastructure Development”, is impressively being shaped by the consortia and consortia initiatives themselves<sup>1</sup> – it is clear that there are two different types of cross-cutting topics, which in the view of the NFDI Expert Committee require different procedures and approaches with regard to their treatment. A differentiation should be made between two categories of cross-cutting topics: firstly, cross-cutting topics that can be addressed by different smaller or larger groups of networked consortia and lead to different solutions and secondly, those cross-cutting topics that concern the joint operation of basic services in the NFDI, with which the basic infrastructure provision is guaranteed for potentially *all* consortia.

The first category, i.e., cross-cutting topics that can be addressed by different groups, includes issues relating to governance, the establishment of reputation mechanisms, the conveyance of relevant competencies, the recruitment of qualified personnel or the treatment of legal and ethical matters. Even in cases where different groups of consortia engage with the same topics, the solutions that result from the respective discussions can complement each other, particularly since a certain amount of competition between solution approaches to content-related issues can certainly be productive. The proposals submitted in the first round show that many cross-cutting topics will be handled across different consortia, and that consortia also submitted for funds for the requisite interaction between them.

The situation is different when it comes to the second category, the basic services. Here, it is imperative that a situation is avoided in which the development and implementation of basic services in the NFDI leads to different solutions that deviate from each other and that are not compatible. These basic services are a matter of interest for all consortia. They must be handled in a coordinated, synchronised manner. Technical and semantic services, such as approaches to authentication and authorisation, as well as tools for data annotation and a standardised description of software codes that applies to all consortia, are constitutive in such a way that the elaboration or development of competing solutions within individual consortia in relation to these issues would seriously endanger the successful development of the NFDI. These, along with other shared services described in the “Leipzig-Berlin Declaration on NFDI cross-sectional issues of infrastructure development”, should be clearly oriented to the latest developments, and thus also to solutions that already exist. It is only in this way, and through

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<sup>1</sup> Both declarations are available at <https://doi.org/10.5281/zenodo.3457213> and <http://doi.org/10.5281/zenodo.3895208>.

a technical framework for standardisation and quality assurance that applies to all consortia, that the interoperability of the subject-oriented NFDI consortia and their national and international connectivity can be properly secured, and that the prerequisites can be provided for the ongoing availability of the services. For this reason, the solutions required for this purpose must be developed in a process that is supported by all consortia, and which is accepted across the board by all consortia and consortia initiatives.

Against this background, the NFDI Expert Committee regards a strictly competitive procedure, similar to the selection process of the subject-oriented consortia, as being an unsuitable tool for initiating the specific handling of basic services in the NFDI. The consortia themselves must formulate their ideas and assessments of the planned services. Ultimately, only they can judge whether these services adequately meet their needs. Furthermore, the particular unique feature of the consortia and thus of the NFDI is that the organisation of research data management is regarded as the shared responsibility of researchers and experts from the infrastructure field. Putting this shared responsibility into practice at all levels of the NFDI is a condition for the success of the consortia and the NFDI, the importance of which cannot be overestimated. For this reason, a negotiation process is needed with regard to the form that such basic services should take, in order to agree on a shared, collaborative procedure to determine points in time by which basic services should be established, and to secure the binding nature of the solutions developed. Since this is a process of negotiation, via which the infrastructural foundation will be laid for future work in all consortia, this process must be driven forward and supported by the consortia and consortia initiatives themselves. This is even more necessary since the decisions regarding the direction to be taken should ideally be implemented as binding by all consortia. In accordance with the architecture of the NFDI, in such a comprehensive discussion of this nature, the NFDI Directorate takes on the role of central moderator and controller, with the involvement of the subject-based structures provided for the purpose, namely the NFDI Association and the NFDI Senate responsible for the strategic orientation of the NFDI.

The implementation and quality assurance of such basic services should primarily be initiated by subject-oriented consortia. However, the process of negotiation described above can also result in a situation in which further structures and stakeholders beyond the subject-oriented consortia have to be involved in the implementation of basic services. It is possible that several consortia could together take on responsibility for certain basic services, possibly within the framework of strategic partnerships, including with stakeholders or institutions that do not yet receive funds within the framework of the NFDI. Such structures must be funded in the same long-term and sustainable manner as the funding of the subject-oriented consortia themselves.

#### *4. Further funding requirements*

However, the question remains unresolved as to which budgets should be used to fund the re-use or development and implementation of cross-cutting topics and basic services. It could already clearly be seen during the first selection round for the funding of consortia that there is a gap between the available funds and the requirements confirmed by the review process. This results in cuts of around 25% on average. Furthermore, it has become apparent that the available funds of 70 million euros per year for direct project costs will be required to finance the subject-oriented consortia, which should be given priority according to the specifications of the agreement between the federal government and the states. Any funding of the necessary NFDI-wide basic services solely from the funds awarded or yet to be awarded to the consortia themselves appears to be insufficient – as the cuts that have now become necessary clearly demonstrate. For this reason, there is in our view a further and urgent need for funding for basic services in the NFDI. Funds should be provided as near as possible in the context of the NFDI. The options that are appropriate from a financial and procedural perspective must be discussed and further specified in the near future. Against this background, the NFDI Expert Committee requests that the university and non-university institutions involved in the consortia consider the extent to which they can support the establishment of cross-cutting services in the NFDI within the scope of their own strategic focus. The NFDI Expert Committee further appeals to the federal government and the states to consider to what extent additional funding options can be created for the implementation of shared services. The Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) is also requested to examine the extent to which funding of the development or the implementation of shared services in the NFDI can be supported by means of the relevant programmes in the “Scientific Library Services and Information Systems” funding area.