



utilize and preserve text- and  
language-based research data



# Annual Activity Report 2024/25

## Infrastructure/Operations

3rd & 4th Project Years 01.10.2023 – 31.12.2025

## Executive Summary

During the reporting period from October 2023 to December 2025, the Task Area Infrastructure and Operations (IO) of the NFDI consortium Text+ has consolidated its role as the operational and technical backbone of the overall research data infrastructure for text- and language-based research in the humanities. IO has focused on transitioning core services and components from a project-oriented development phase toward a sustainable, service-oriented operational model. This shift is reflected in the maturation of the Text+ web portal, the Federated Content Search (FCS), and the Text+ Registry, as well as in the growing integration with Base4NFDI services and cross-consortium initiatives.

Key developments include the release of major new versions of the FCS Aggregator and web client, the expansion and professionalization of the Registry as a federated meta-catalog for heterogeneous research data resources, and the establishment of standardized workflows for documentation, accessibility, and editorial processes within the web portal. In parallel, IO has advanced long-term preservation (LTP) services, strengthened identity and access management (AAI) integration via NFDI-wide infrastructures, and contributed substantially to interoperability through authority data (GND) and metadata harmonization activities.

IO has also intensified its community-facing activities through structured training, a "Show and Tell" event format, and contributions to national and international conferences. These efforts have been complemented by close coordination with Base4NFDI projects such as DMP4NFDI, IAM4NFDI, PID4NFDI, Jupyter4NFDI, and Accounting4NFDI. The positive assessment by the DFG review panel in late 2025, which highlighted the robustness of the technical architecture, effective governance, and strong community integration, underscores the success of IO's strategic direction.

Looking ahead to the end of the first funding phase and into Phase 2, IO has articulated clear operational priorities, including improving the integrated user experience across services, strengthening data quality management in collaboration with data domains, and further professionalizing monitoring, documentation, and sustainability strategies for Text+ services.

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## 1. Role and Strategic Orientation of IO within Text+

The [Task Area Infrastructure and Operations \(IO\)](#) serves as the coordination layer for the technical, operational, and service-related components of [Text+](#). Its mandate encompasses the design, implementation, and sustainable operation of cross-domain infrastructure elements that enable findability, accessibility, interoperability, and reuse of data and services.

Throughout the reporting period (2024/25), IO has progressively shifted its focus from primarily development-driven activities toward a more mature service-oriented and product-focused approach. This strategic realignment is reflected in internal discussions framed under the guiding principle “**from project to product**”, particularly in preparation for phase 2 of the Text+ funding period. The emphasis has been placed on operational reliability, usability, sustainability, and integration with national infrastructure services.

<b>104</b>  <b>Tools &amp; services for the community</b>	<b>758</b>  <b>Helpdesk &amp; consultation requests solved</b>	<b>528</b>  <b>Publications via the project bibliography</b>	<b>1.097.822</b>  <b>Data sets via FCS and Registry</b>	<b>336</b>  <b>Deploys to the Text+ portal</b>
<b>21</b>  <b>Text+ Centers ... and counting</b>	<b>286</b>  <b>Events ... and counting</b>	<b>12</b>  <b>Working groups and task forces</b>	<b>34.400</b>  <b>Webportal visits</b>	<b>6</b>  <b>Basic service proposals</b>

Selected achievements of Text+ in numbers (portal visits: 2023-25)

IO operates in coordination with the [data domains](#) and the project leadership. Particular attention has been given to strengthening horizontal communication across task areas and vertical communication between operational units and the steering and governance structures. This coordination has been essential for aligning technical developments with community needs, DFG requirements, and NFDI-wide architectural and governance frameworks.

## 2. Governance, Coordination, and Cross-Consortium Integration

### 2.1 Internal Coordination and Measure Structure

IO's work is structured into five measures, covering findability, accessibility, interoperability, community activities, and software services. A recurring topic in IO meetings has been the representation of data domains within IO governance structures, particularly in relation to the [Registry](#) and service integration. This has led to the establishment of editorial and task force formats (e.g., Registry editorial group, web portal group) to ensure that domain-specific requirements are systematically incorporated into technical and operational decisions.

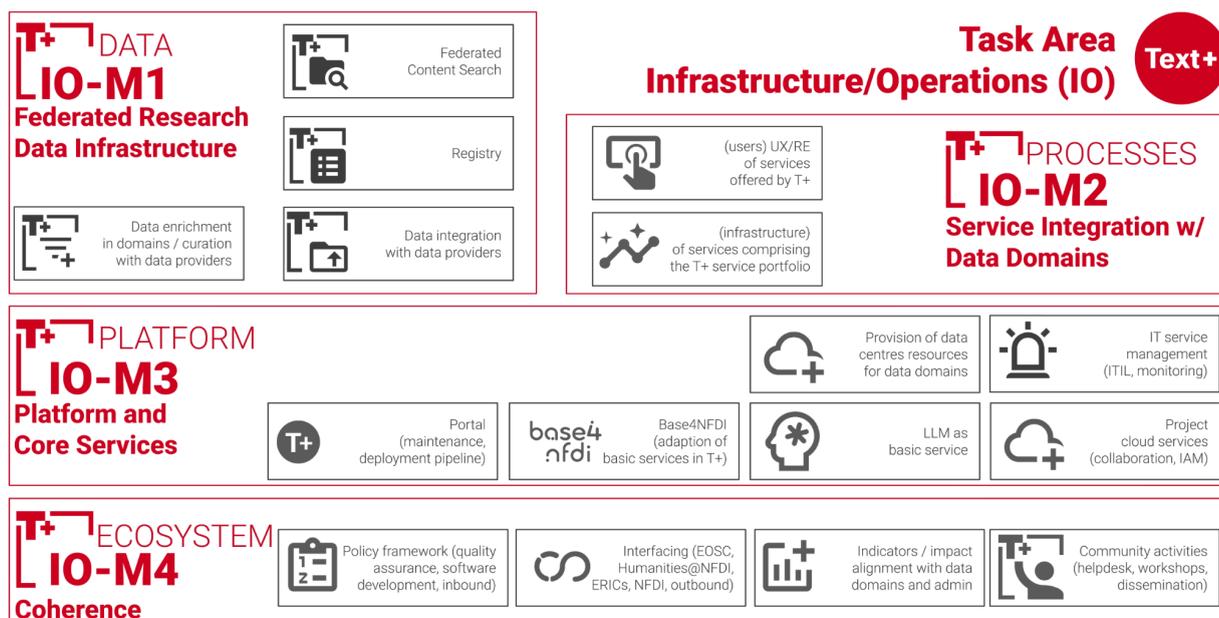
### 2.2 Base4NFDI and NFDI-Wide Alignment

IO has played an active role in aligning Text+ services with national [Base4NFDI](#) services. This includes close collaboration with [IAM4NFDI](#) for identity and access management, [PID4NFDI](#) for persistent identifiers, [TS4NFDI](#) and [KGI4NFDI](#) for terminology service and knowledge graph integration, and [Jupyter4NFDI](#) for computational and notebook-based research environments.

Particular emphasis has been placed on ensuring that Text+ services can interoperate with the Basic services through standardized interfaces, shared authentication and authorization infrastructures, and harmonized metadata and documentation practices. The transition of AAI integration towards the NFDI Infra Proxy and the adoption of [AcademicID](#) as an authentication provider are notable milestones in this context.



## 2.3 Contribution to the Text+ 2 Continuation Proposal

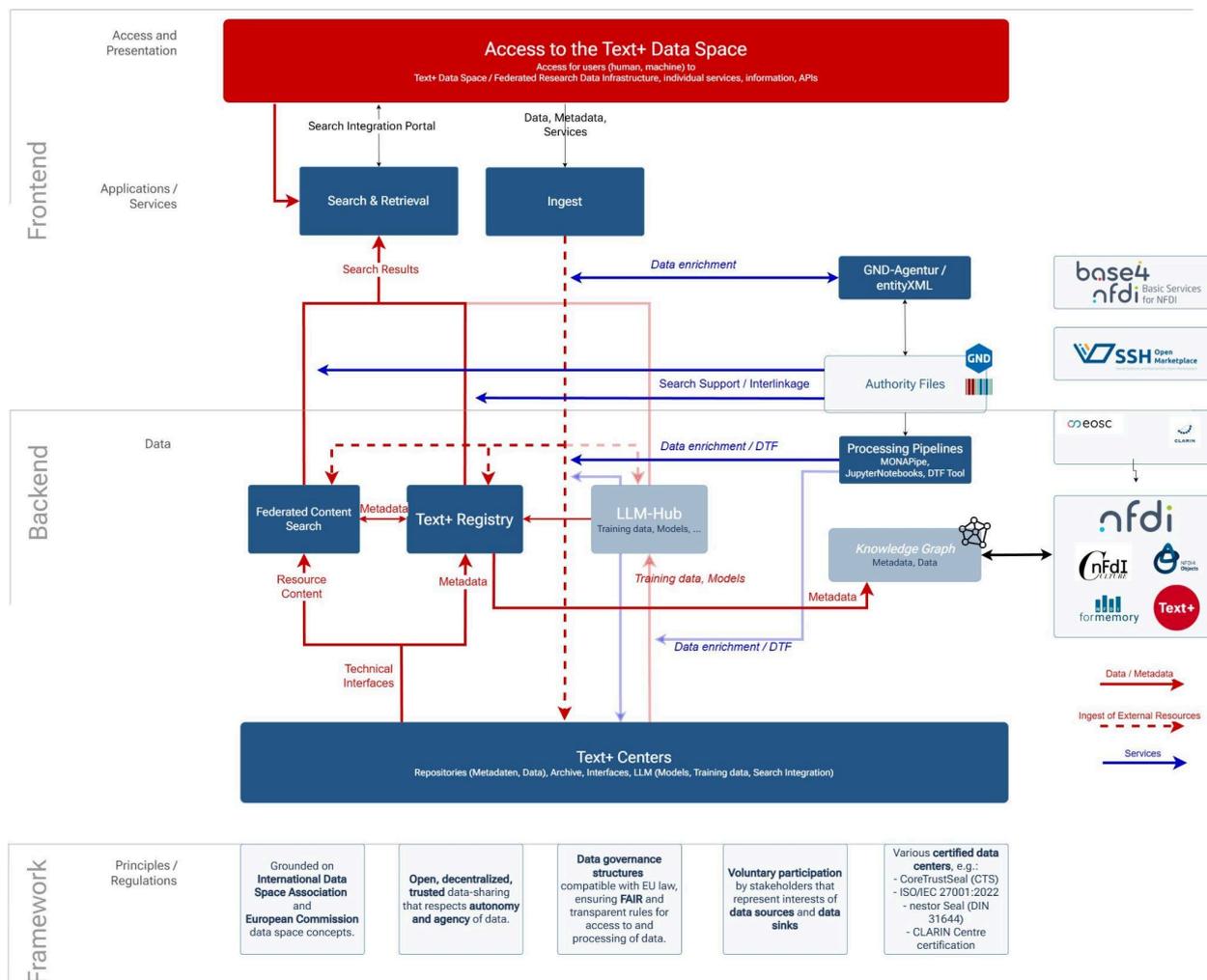


Proposed TA structure for phase 2

IO has contributed substantially to the renewal proposal for Text+. Insights gained during phase 1, coupled with the requirements of a [prospective phase 2](#), have led to a structural reorganization. In the future, this area will be specifically geared toward the operation of a modular research data infrastructure. Beyond the further development of search and retrieval services, the primary focus will be on establishing an interoperable architecture of services and data that adheres to established standards. In collaboration with the data domains, the expansion of available, enriched, and reusable research data will be prioritized even more heavily than in phase 1.

## 2.4 The Text+ Architecture

The [architecture](#) is organized into three levels: user, frontend, and backend. The [Text+ portal](#) serves as the central access point for all services, including [consulting](#), [data searches](#), and [research data submissions](#). A key feature is the interactive architectural diagram: clicking on components, such as the "[Text+ Registry](#)," links you directly to the corresponding service. This makes the mapping itself functional rather than just illustrative. Additionally, the figure supports deep zooming for detailed viewing.



Text+ Architecture 2.0 as of 12/2025 (<https://text-plus.org/en/ueber-uns/architektur/>)

## 2.5 External Review and Strategic Feedback

The [DFG review panel's feedback](#), delivered in late 2025 in the context of the phase 2 application, provided a strong external validation of IO's work. The panel highlighted the robustness of the technical architecture, the effectiveness of governance structures, and the consortium's strong intrinsic motivation. At the same time, it formulated strategic recommendations that have been taken up within IO, including:

- Improving the integrated user experience across services and interfaces.
- Strengthening international collaboration, particularly beyond Europe.
- Increasing the visibility and impact of cross-consortium cooperation within the NFDI landscape.

These recommendations have informed IO's operational goals and planning for the remainder of phase 1 and the transition into phase 2.

### 3. Core Infrastructure Components and Technical Developments

#### 3.1 Federated Content Search (FCS) – Searching structured data and full-texts

The [Federated Content Search \(FCS\)](#) has continued to evolve as a central findability service for the content of distributed text and language resources within Text+. A major milestone during the reporting period was the release of the [FCS Aggregator version 4.0](#), which is a rewrite of the former implementation introducing many architectural refinements, improved endpoint statistics, and was developed in close cooperation with [CLARIN.ERIC](#).

With regard to the Federated Content Search, the following services and functionalities are provided:

- webportal [Text+ Federated Content Search](#) allowing access to the full text and annotations of currently 588 resources (48 lexical resources, 540 corpora or other fulltext resources) and
- work on the general search functionality of the new Text+ web page, including its connection to external search interfaces, and
- the direct integration of the FCS in the new Text+ portal search functionality ([FCS Web Client](#)).

The screenshot displays the Text+ Search webportal interface. At the top, there is a search bar with the query 'Apfel' and a language selection dropdown set to '3/10 Languages' (German, Middle High German, Lower Sorbian). Below the search bar, there are statistics: 588 available resources, 43 requested, 19 pending, and 11 matching. A response time of 9.1 is shown. The search results section indicates that the search for 'Apfel' returned 162 results (43 loaded) in 11 resources. Below this, there are two tabs: 'RESOURCES' and 'RESULTS'. The 'RESOURCES' tab is active, showing a list of seven resources with their respective counts and progress indicators:

Resource Name	Count	Progress
A. Muka: Dictionary of the Lower Sorbian Language and Its Dialects 1911-1928 (Digital edition)	56	5
Dictionary of the German Contemporary Language	1	2
Digital Dictionary of the German Language	1	1
Discourse on "gullt" 1945-55	1	1
elexiko - Online dictionary of contemporary German language	83	0
Etymological Dictionary of the German Language	1	0
German Loanword Dictionary	10	0

Search integration in the relaunched Text+ webportal

The FCS Web Client, integrated into the Text+ portal, has been enhanced with improved usability, contextual help features, and support for specialized search modes such as lexical and entity/authority file based queries. As part of this work, the Text+ website search was integrated in the overall search integration on the portal. Feedback from dedicated usability workshops, particularly in collaboration with the data domain [Lexical Resources](#), has been systematically incorporated into the interface design and functional roadmap.

IO has also advanced the integration of FCS with the Text+ Registry, aiming to create a tighter coupling between resource descriptions and search endpoints. This includes technical work on shared data models, analytics to identify gaps in resource coverage and metadata quality, and the exploration of hybrid search workflows that combine registry-based discovery with federated content retrieval.

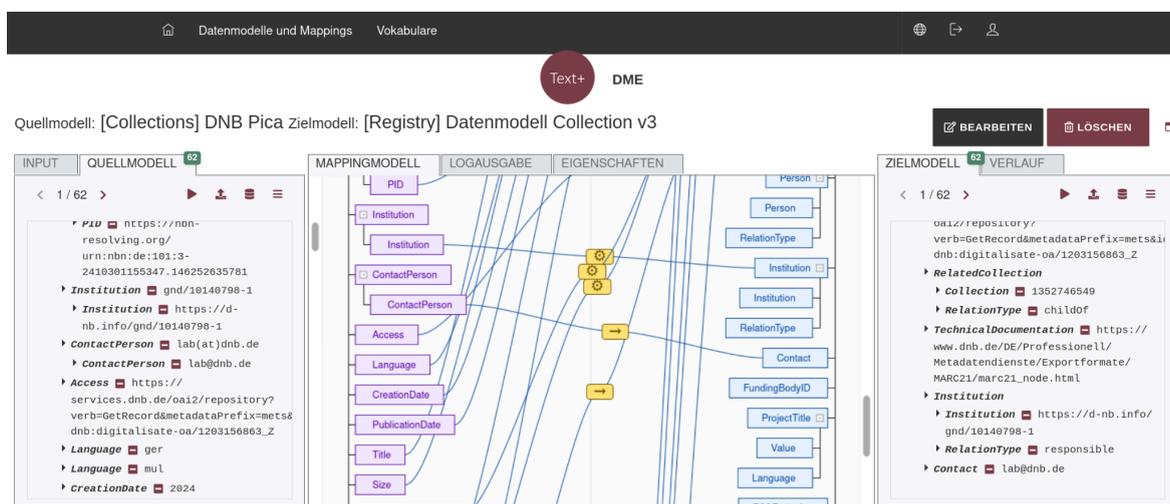
Authentication and authorization support for FCS has been aligned with NFDI-wide AAI services, enabling single sign-on scenarios and preparing the service for broader integration into national and international research infrastructures.

### 3.2 Text+ Registry – The Metadata catalog

The [Text+ Registry](#) has matured into a central federated meta-catalog for heterogeneous research data resources, services, and collections across the [Text+ consortium](#). Its development has focused on supporting imports from diverse source systems, managing vocabulary and authority data links, and enabling editorial curation workflows.

Key developments include the establishment of a dedicated issue and feedback tracking system, the introduction of backend versioning for institutional and vocabulary data, and the implementation of enhanced search features such as recommendations, relevance feedback, and more prominent resource linking.

To be able to import existing, yet heterogeneous resource descriptions—as well as to provide interoperable output e.g. in the form of DataCite records—the Text+ [Data Modeling Environment](#) and associated services support mappings for the Registry.



DME with a prototypical mapping of sample DNB (Pica) data to the collections data model

The Registry has increasingly been positioned as a quality management instrument, not only for improving findability but also for raising awareness of metadata completeness, authority data usage (e.g. [GND identifiers](#)), and domain-specific standards. Analytics tools have been introduced to provide quantitative insights into data coverage and quality, supporting targeted engagement with data centers and domain partners.

The alignment of the Registry with the Text+ portal has been further refined through direct service linking and user interface adjustments, reducing barriers between discovery and access and contributing to the goal of a more coherent “one-stop” user experience.

### 3.3 Web Portal and Editorial Infrastructure: Interfacing Text+

The [Text+ web portal](#) has developed into a central communication, discovery, and service entry point for the consortium. During the reporting period, the portal has undergone continuous expansion, reaching about 500 pages and achieving very stable monthly usage figures of roughly 1500+ visits since launch:



#### 4.2.2 Interoperability and Authority Data

Following the launch of the GND Agency Text+, current efforts focus on increasing the volume of research data enriched with authority data and deepening integration with the GND community and other humanities consortia. Workshops and publications have addressed the technical and organizational challenges of authority data in the Text+ Data Space, while the development of cross-domain standards and harmonized metadata models continues in close coordination with other NFDI consortia and Base4NFDI.

#### 4.3 Long-Term Preservation

The development of a generic long-term preservation service has been one of the major operational commitments within IO. During the reporting period, a functional workflow and user interface have been established, enabling the transfer of data from repository environments into a dedicated long-term archive infrastructure.

Key architectural decisions include the separation of active repository storage and archival storage, with mechanisms for retrieval on demand. Community testing phases and feedback workshops have been used to refine access control, user workflows, and documentation. The service is positioned as a core operational offering of Text+ and a visible contribution to national sustainability strategies for research data.

### 5. Community Activities, Training, and Outreach

IO has fostered a strong focus on community engagement and capacity building. This has been realized through a combination of structured training events, open lecture formats, and low-threshold exchange platforms.

[The “Show and Tell” series](#) has emerged as a central format for presenting services, tools, and workflows to both internal and external audiences. With its low-threshold design, the series has facilitated cross-task area learning, early feedback on prototype services, and the dissemination of best practices.

Training and teaching materials have been systematically collected and curated within the web portal, drawing on both Text+ contributions and external resources.

IO members have also contributed extensively to national and international conferences, workshops, and publications, including events organized by DARIAH, CLARIN, and NFDI-wide working groups. These activities have strengthened Text+'s visibility and integration within the broader research infrastructure landscape.

#### 5.1 RDMO – Text+ adapted Research Data Management Organizer

The creation of a data management plan in an early stage of a research project is not only a third-party funder requirement, but it also increases the sensitivity of researchers to create FAIR research data in all phases of a standardised data life cycle. [RDMO](#) (Research Data Management Organizer) is a tool that supports research projects in the administration of this task and facilitates collaborative agreements of different project partners. IO therefore provides a catalog via the RDMO instance ([GRO.plan](#)) of the eResearch Alliance (SUB Göttingen) that is adjusted to Text+ in the form of discipline specific questions, explanations, links and references (e.g. links to Text+ repositories and requirements of metadata for the ingest, etc.).

In this context, the activities of the NFDI working group DMP (section-infra) are monitored and especially the currently developed quality criteria for DMP templates are implemented via a so-called Incubator project Text+ has taken on with [DMP4NFDI](#). The Text+ specific RDMO catalog can already be accessed via the [Text+ website](#) and will remain a continuous part of the project's

service portfolio. It will be accompanied by extensive consulting services, ensuring the community's ideal uptake and use of the service.

**GÖTTINGEN RESEARCH ONLINE PLAN**

## Neues Projekt erstellen

**Titel**  
Titel des Projektes oder Forschungsgebietes für den ein Forschungsdatenmanagementplan (DMP) erstellt wird.

**Beschreibung**  
Beschreibung des Projekt oder Forschungsgebietes.

**Katalog**  
Katalog der Förderungs- oder Disziplin bezogenen Fragen welche bei der Erstellung des DMP verwendet werden. Kann später geändert werden.

- RDMO**  
Generischer Fragenkatalog für alle Disziplinen
- Horizon Europe**  
RDMO-Fragenkatalog für das EU-Rahmenprogramm "Horizon Europe" (2021-2027) der Europäischen Kommission
- European Research Council (ERC)**  
Template für den ERC Open Research DMP
- Software-Management-Plan für Forschende**  
Katalog für das Management von wissenschaftlichen Software-Projekten
- GRK 2824**  
Katalog spezifisch für GRK 2824 "Herz und Gehirn: Integrative Forschung über Organgrenzen hinweg"
- Fragenkatalog für Text+**  
Katalog spezifisch für Anforderungen von sprach- und textbasierten Forschungsdaten
- DFG allgemeiner Katalog**  
DFG-Katalog ohne disziplinspezifische Anforderungen

Screenshot taken from the GRO.plan interface where the Text+ catalog is listed among other RDMO catalogs.

## 5.2 Cooperation with SSHOMP for Curated Catalogs

[The service list](#) presented in the Text+ portal is based on a procedure involving the harvesting of a curated subset of resources from the SSH Open Marketplace API. This lightweight and robust method was expanded during the reporting period to include [training materials](#), thereby addressing a formal recommendation (monitum) from the interim report. In cooperation with the Editorial Board of the SSH Open Marketplace, this procedure was also successfully rolled out for [the Association for Research Infrastructure in the Humanities and Cultural Studies](#) (Verein Geistes- und kulturwissenschaftliche Forschungsinfrastrukturen).

## 5.3 Helpdesk

IO provides and maintains the technical infrastructure of the Text+ helpdesk. This includes the configuration of the underlying GOTRS in terms of queues and agents and also the day-to-day monitoring of incoming tickets. The most active queue in terms of tickets are the data ingest queue and the event queue. Via the [webportal](#), any user can request a subpage highlighting a new event. IO maintains continuous coordination with GWDG, which operates the GOTRS platform as the helpdesk infrastructure for the Göttingen campus.

## 5.4 Cooperation with DARIAH – Infrastructure as a Living Ecosystem

In 2025, the SUB organized the [DARIAH Annual Event](#) jointly with the Text+ Community Plenary to [connect the national and European communities of humanities research infrastructures](#).



DARIAH Annual Event 2026 (CC BY Martin Liebetruh, Göttingen State and University Library)

## 6. Software Services and Computational Infrastructure

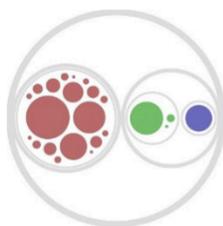
Within Measure 5, IO has supported the continued development and professionalization of software-based services, with a particular focus on the TextGrid and DARIAH-DE repositories, as well as computational environments.

### 6.1 [Fluffy Publication Workflow](#)

In collaboration with the Collections data domain, IO has revised the data depositing workflow for the TextGrid Repository. Established in 2006, the TextGrid Repository is a long-standing infrastructure for XML-TEI data. This initiative not only improves the TextGrid Repository but also contributes to the broader data depositing framework within Text+. These efforts have resulted in [numerous new projects](#) (i.e. data collections).



### Projekte im TextGrid Repository



CoNNSA: Corpus of Novels of the Spanish Silver Age



GRETEL



Multilingual Parallel Bible Corpus

[Projects gallery in TextGridRepository](#) (currently over 50 projects)

Notable other developments include:

- The recognition of TextGrid and DARIAH-DE repositories as curated CLARIN centers.
- The introduction of updated persistent identifier workflows, including new PID suffix schemes and the planned implementation of DOI assignment.

- In close collaboration with Jupyter4NFDI, IO has explored the integration of computational notebooks, data mounts, and real-time collaboration features as part of a broader vision for reproducible, service-integrated research workflows.

## 7. Achievements and Outcomes

Across the reporting period, IO has delivered a wide range of tangible outcomes, including:

- The establishment of a [comprehensive services catalog](#) with over 100 documented offerings.
- Major releases of the [FCS Aggregator](#) and [Web Client](#).
- The operationalization of the [Text+ Registry](#) as a federated meta-catalog.
- The deployment of a [long-term preservation workflow](#) and user interface.
- The publication of [numerous peer-reviewed and community-oriented contributions](#) related to Text+ infrastructure and standards.
- The implementation of accessibility and editorial quality assurance mechanisms within the web portal.

These achievements have contributed to measurable increases in the visibility, usability, and sustainability of Text+ services at both the national and international levels.

## 8. Outlook and Priorities for Phase 2

Building on the foundations established during phase 1, IO has defined a set of operational priorities for the transition into phase 2:

- Further integration of services into a coherent, user-centered interface with harmonized entry points and documentation.
- Strengthening data quality management in collaboration with data domains and registry editorial structures.
- Expanding international collaboration and visibility, particularly beyond the European research infrastructure landscape.
- Professionalizing monitoring, analytics, and sustainability strategies for long-term service operation.

Through these measures, IO aims to consolidate Text+ as a reliable, high-quality, and internationally connected research data infrastructure for text-based scholarship.

## 9. Appendix

### 9.1 Composition of IO and its embedding in the community of interest

IO integrates and coordinates the infrastructure development of Text+ – for the consortium itself, and the NFDI as a whole – and cooperates closely with the three data domains. The tasks are structured in measures according to the FAIR principles: **M1 Findability, M2 Accessibility, M3 Interoperability and Re-Usability**. These three measures are flanked by **M4 Community Activities** and **M5 Software Services**.

Apart from the participating institutions, IO relies substantially on the interaction, feedback and contribution of its community of interest. IO's community of interest consists of the task areas of Text+, the Text+ cross cutting topics working groups and structures of the NFDI community, particularly Base4NFDI (see below), the NFDI sections, and the Humanities@NFDI group (NFDI4Culture, NFDI4Memory, NFDI4Objects, Text+), and additionally the community at large, usually in the form of individual researchers or research projects, specialist information services (FID), or professional associations, drive the work in the task area.

The following institutions participate in IO:

- Deutsche Nationalbibliothek, Arbeitsstelle für Standardisierung
- Forschungszentrum Jülich
- Gesellschaft für wissenschaftliche Datenverarbeitung mbH Göttingen
- Hochschule Wismar (joined as collaborative project in 2024)
- Leibniz-Institut für Deutsche Sprache, Mannheim
- Max Weber Stiftung
- Sächsische Akademie der Wissenschaften zu Leipzig
- Niedersächsische Staats- und Universitätsbibliothek Göttingen
- Technische Universität Dresden
- Universität Bamberg, Lehrstuhl für Medieninformatik

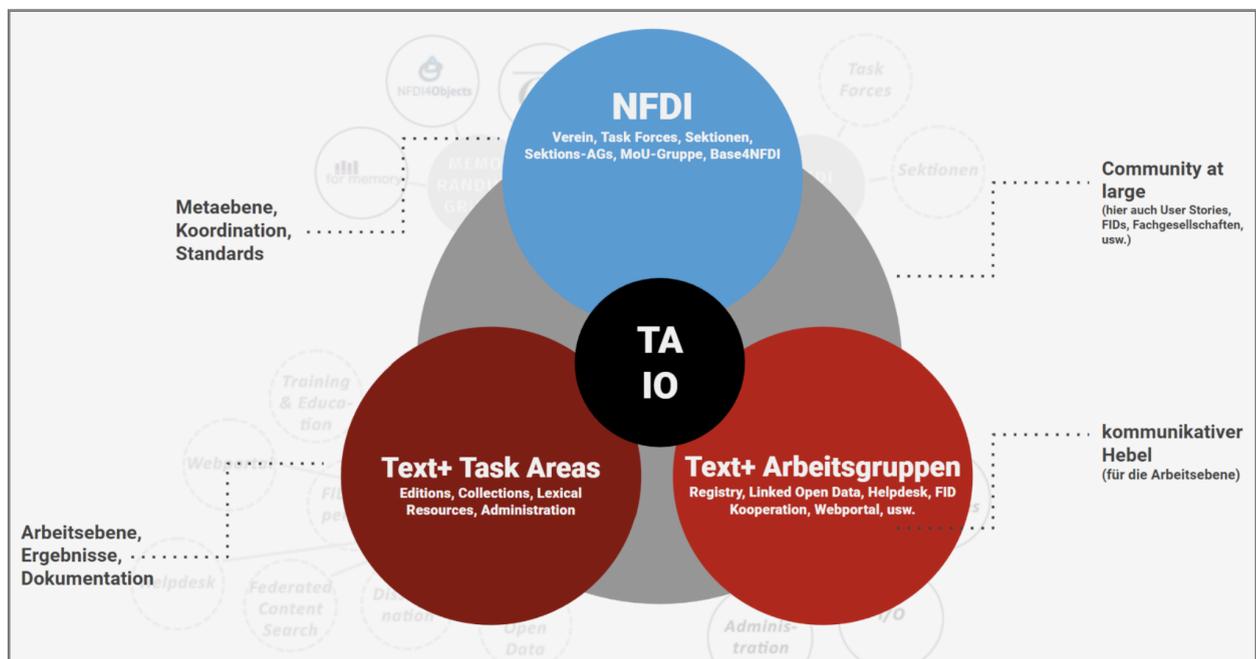
The progress of work in IO is monitored by the **Operations Coordination Committee (OCC)**. The OCC serves as a community hinge, and its voting members are nominated and elected by the community (Fachgesellschaften, FIDs). Additionally, non-voting members complete the committee as Text+ insiders with the day-to-day overview of the activities.

- Prof. Vivien Petras, PhD. Humboldt-Universität zu Berlin (OCC Chair)
- Prof. Dr. Philipp Wieder, Georg-August-Universität Göttingen, Niedersächsische Staats- und Universitätsbibliothek Göttingen (non-voting member)
- Prof. Dr. Andreas Henrich, Otto-Friedrich-Universität Bamberg (non-voting member)
- Reinhard Altenhöner, Staatsbibliothek zu Berlin, Preußischer Kulturbesitz
- Prof. Dr. Andreas Degkwitz, Universitätsbibliothek der Humboldt-Universität zu Berlin
- Eric Eggert, Universität Köln
- Dr. Brigitte Mathiak, GESIS - Leibniz-Institut für Sozialwissenschaften (OCC Co-Chair)
- Dr. Sebastian Herrmann, Universität Leipzig
- Prof. Dr. Gerhard Heyer, Sächsische Akademie der Wissenschaften zu Leipzig (non-voting member)
- Mathias Razum, FIZ Karlsruhe - Leibniz-Institut für Informationsinfrastruktur
- Heike Renner-Westermann, Universität Frankfurt
- Dr. Verena Weiland, Universität Bonn
- Dr. Patrick Helling, Universität Köln

In 2024 and 2025, IO participated in the 3rd and 4th call for [collaborative projects](#). Each year of its funding period, Text+ offers a considerable grant for cooperation projects with the intention to integrate new research data collections into the Text+ portfolio, or – in the case of IO – to contribute to the infrastructural development. 2024 and 2025 the following projects were assigned to IO:

- *HAdW GND-basierte Webservices - Beaconizer and Discoverer (Hagrid), Projektleitung: Dr. Frank Grieshaber, Heidelberger Akademie der Wissenschaften*
- *ISO 24624:2016 Transcription of spoken language: Ressourcen, Dokumentation und multilinguales Korpus (Transcription+), Projektleitung: Dr. Thomas Schmid, Universität Duisburg-Essen*
- *Werkzeugunterstützung für die automatische Extraktion von Tabellendaten aus historischen Zeitungen (Swinemünder Badeanzeiger), Projektleitung: Prof. Dr.-Ing. Frank Krüger, Hochschule Wismar (2024)*

## 9.2 The consortium within the NFDI/General contribution to the NFDI



The interplay of the Task Area IO (German version)

Text+ is active in all (currently) five [NFDI sections](#). IO contributes to the sections (1) Common Infrastructures, (2) Metadata, Terminologies and Provenance, and (3) Training & Education. IO members participate in the respective working groups, such as the WG Research Software Engineering, the WG Persistent Identifiers (Co-Chair by GWDG), Overall Architecture (Co-Chair by GWDG), WG MoU-Ontology Harmonization and RDM-Helpdesk. The active participation in the NFDI community and governance by IO partners is ensured on various levels and a constant reporting item in the task area meetings.

The Humanities@NFDI group (formerly called MoU group of humanities and cultural studies consortia) is highly relevant for IO. Humanities@NFDI plays a valuable role as a group of critical peers with similar user bases. The four consortia share similar approaches with regard to research data standards and practices. The cooperation points toward a joint provision of services. This is partly already practised in the GND task, the “Gemeinsame Normdatei”, where close cooperation is at hand.

Since October 2023, and across nine rounds of Basic Service applications, IO's engagement with the Base4NFDI Basic Services has increased significantly: GWDG was involved as a partner during the integration phase of IAM4NFDI and will likewise participate in the final ramp-up phase, beginning in early 2026. The GWDG continues to be a co-applicant institution in the integration phase of PID4NFDI, and was involved as a partner in both the initialisation phase and the current integration phase of Jupyter4NFDI. At the beginning of 2026, the Basic service candidate Accounting4NFDI will start the initialisation phase, in which GWDG will also act as a co-applicant institution. IO is also involved in the concrete implementation of the Basic services: An IAM4NFDI incubator project with technical support from IO was successfully completed for the TextGrid and DARIAH-DE repositories. In TS4NFDI, Text+ has an incubator with its Discuss Data service. M4 of IO is currently working on launching an incubator project for DMP4NFDI as well.

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