

**BERD**  
@NFDI

Text+ FAIR February Meetup – Let's talk FAIR Digital Editions

## Knowledge graphs for interoperable NFDI: Digital editions

Dr. Renat Shigapov, a coordinator of the NFDI Working Group “Knowledge Graphs” in Section “(Meta)data, Terminologies, Provenance”  
UBM - Universitätsbibliothek Mannheim, BERD@NFDI

CC BY 4.0

<https://doi.org/10.5281/zenodo.7645386>

15.02.2023

## Interoperability



## Knowledge Graphs (RDF, SPARQL)

- (Meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation [an example is RDF]
- (Meta)data use vocabularies that follow the FAIR principles [this can be difficult]
- (Meta)data include qualified references to other (meta)data

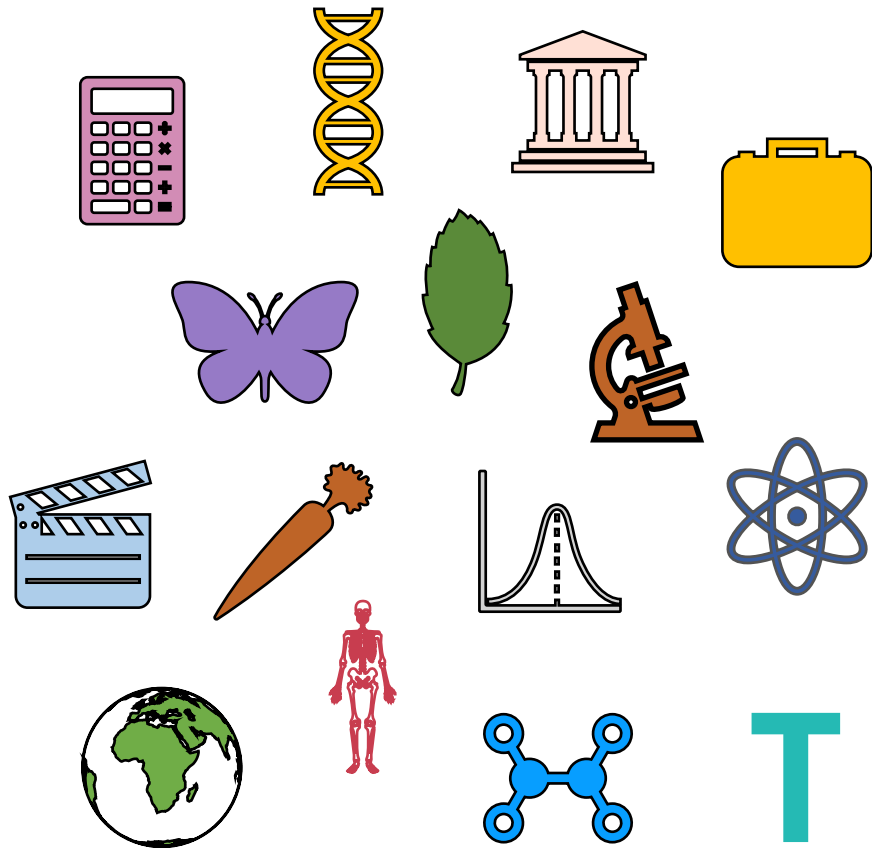


<https://www.go-fair.org>

*“Knowledge Graphs are a key technology for implementing the FAIR principles in data infrastructures by ensuring interoperability for both humans and machines.”* Charter of the NFDI Working Group “Knowledge Graphs”



## 26 research data infrastructures with domain-specific (meta)data standards:



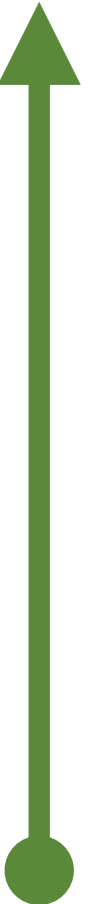
## Various data:

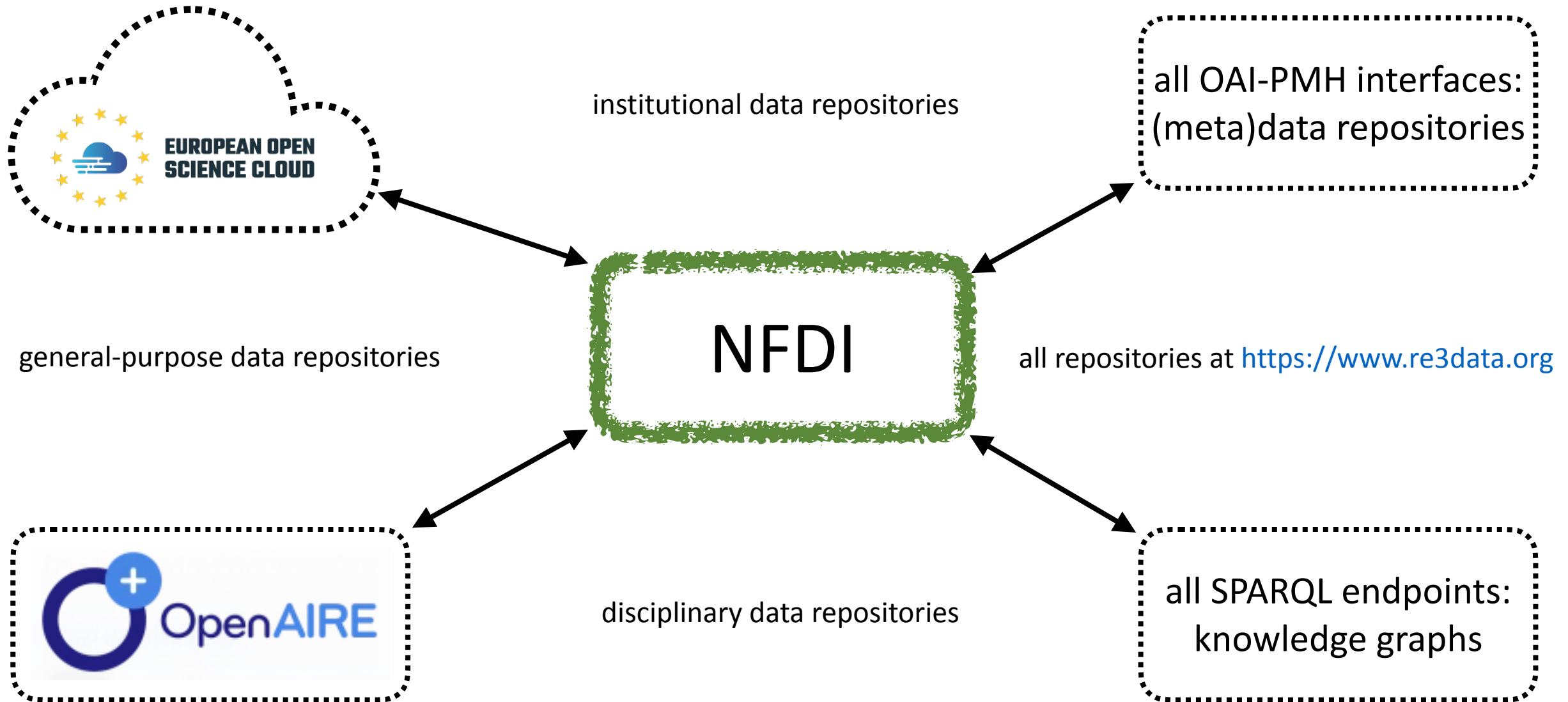
texts  
audio  
video  
tables  
images  
surveys  
models  
samples  
software  
websites  
formulas  
reactions  
databases  
collections  
EL notebooks  
digital editions  
lexical resources

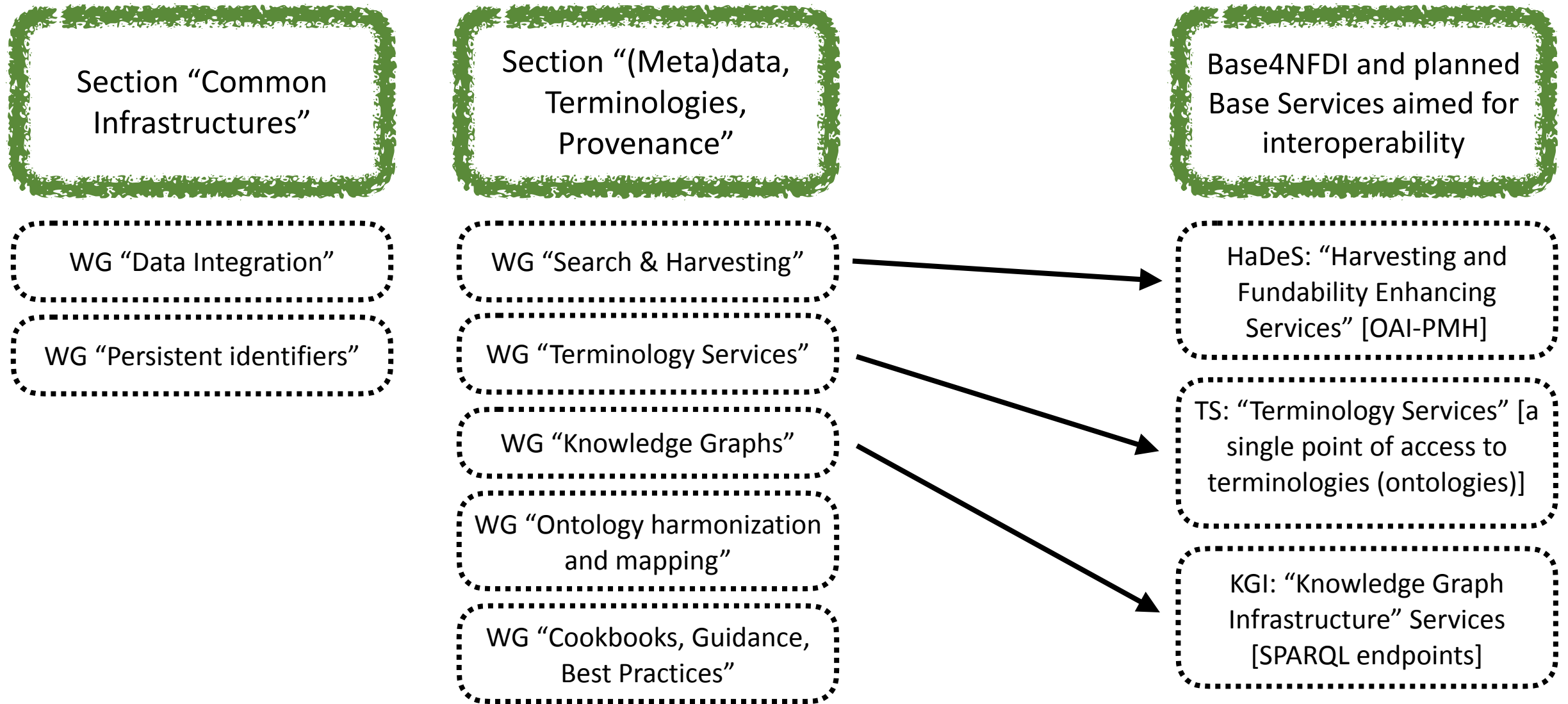
## The degree of internal interoperability in NFDI:

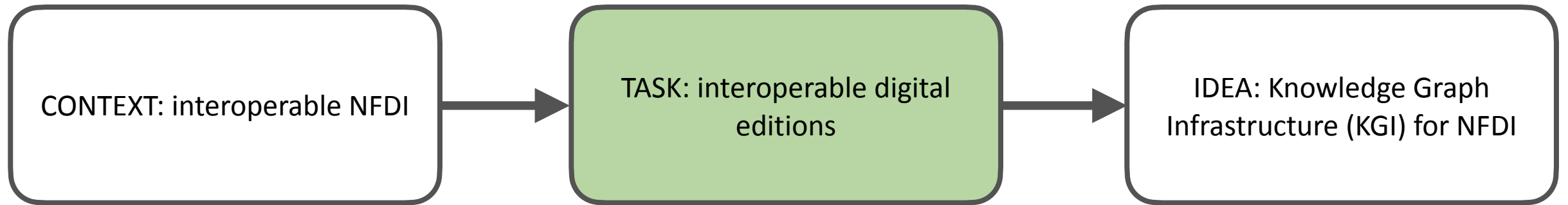
HIGH: consortia provide **terminology (ontology) services** & metadata **knowledge graphs** (a domain ontology + entities) for their research data

LOW: consortia don't provide portals for searching over metadata using the vocabularies following the FAIR principles











Title	Text+ Partner
Theodor Fontane: Notizbücher. Digitale genetisch-kritische und kommentierte Edition	SUB
ARCHITRAVE. Kunst und Architektur in Paris und Versailles im Spiegel deutscher Reiseberichte des Barock	SUB
Maps of God. Building a Portal to Visual Kabbalah	SUB
Bibliothek der Neologie	SUB
Klaus Mollenhauer Gesamtausgabe	SUB
Hannah Arendt. Kritische Gesamtausgabe	SUB
Textdatenbank und Wörterbuch des Klassischen Maya	SUB; NRWAW
Heyne Digital (ARCHAE018)	SUB
Wirkungsgeschichte von Goethes Werk „Zur Farbenlehre“ in Berlin 1810–1832	SUB
Die syrischen und arabischen Ahiqar-Texte	SUB
AdW-Digital: Briefportal Leibniz	SUB, AdWG
AdW-Digital: Carl Friedrich Gauß Briefwechsel	SUB, AdWG
edition humboldt digital	BBAW
Leibniz-Edition. Die Akademie-Ausgabe	BBAW

<https://www.text-plus.org/forschungsdaten/editions-list>

RIDE – A review journal for digital editions and resources  
published by the IDE

About Issues Data Reviewers Reviewing Criteria

Home ▸ Issues

## TEI-XML + OAI-PMH

### Issues

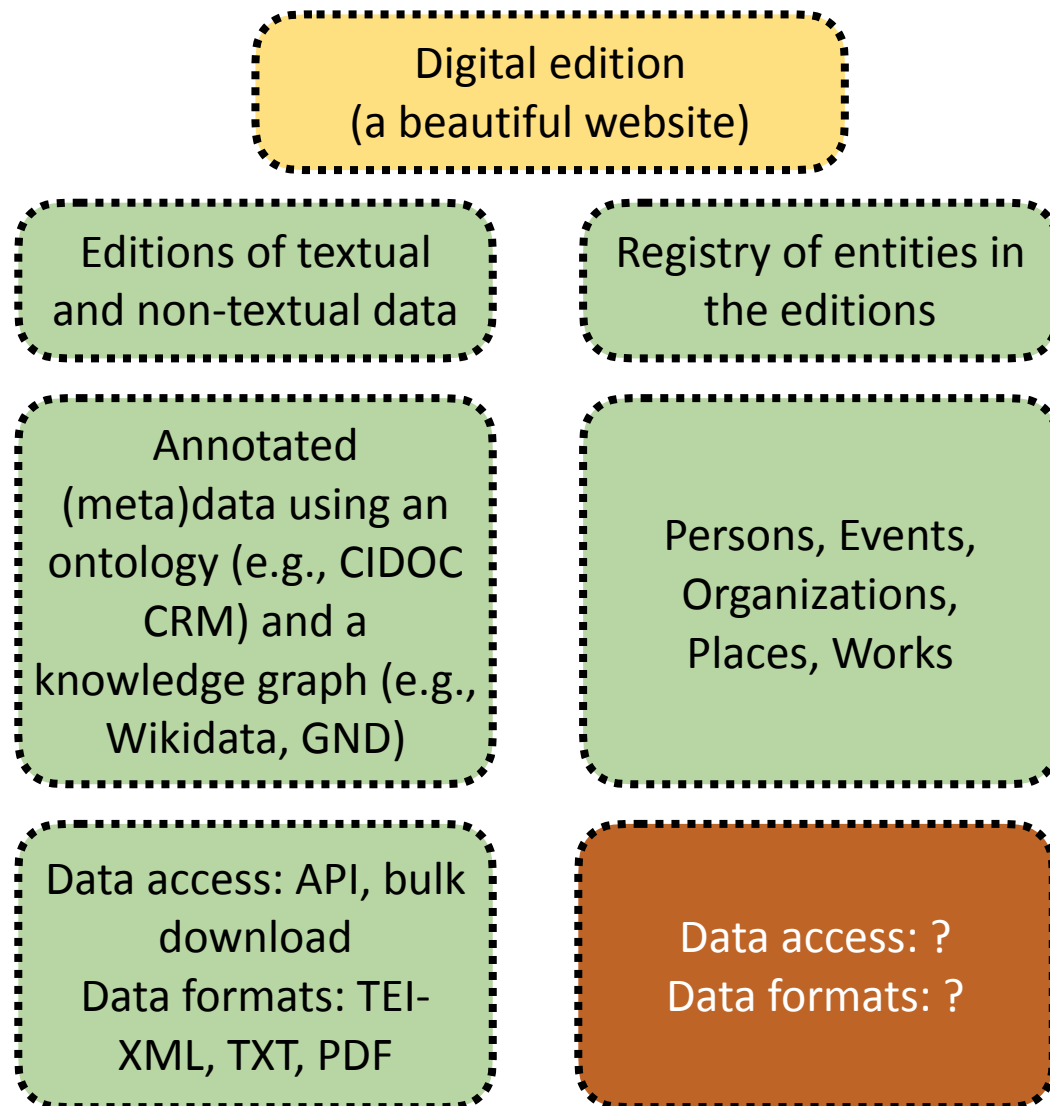
RIDE is published in irregular intervals. So far, the following issues have been published:

#### Issue 15: Tools and Environments (December 2022)

- Digital Mappa – Simple and Web-based Annotations
- Mei-friend. A viewer and last-mile editor for MEI score encodings
- Stylo, un éditeur pour les sciences humaines et sociales
- TEI Critical Apparatus Toolbox: Web-based tools for ongoing XML-TEI editions
- TEITOK, a visual solution for XML/TEI encoding: editing, annotating and hosting linguistic corpora

<https://ride.i-d-e.de>



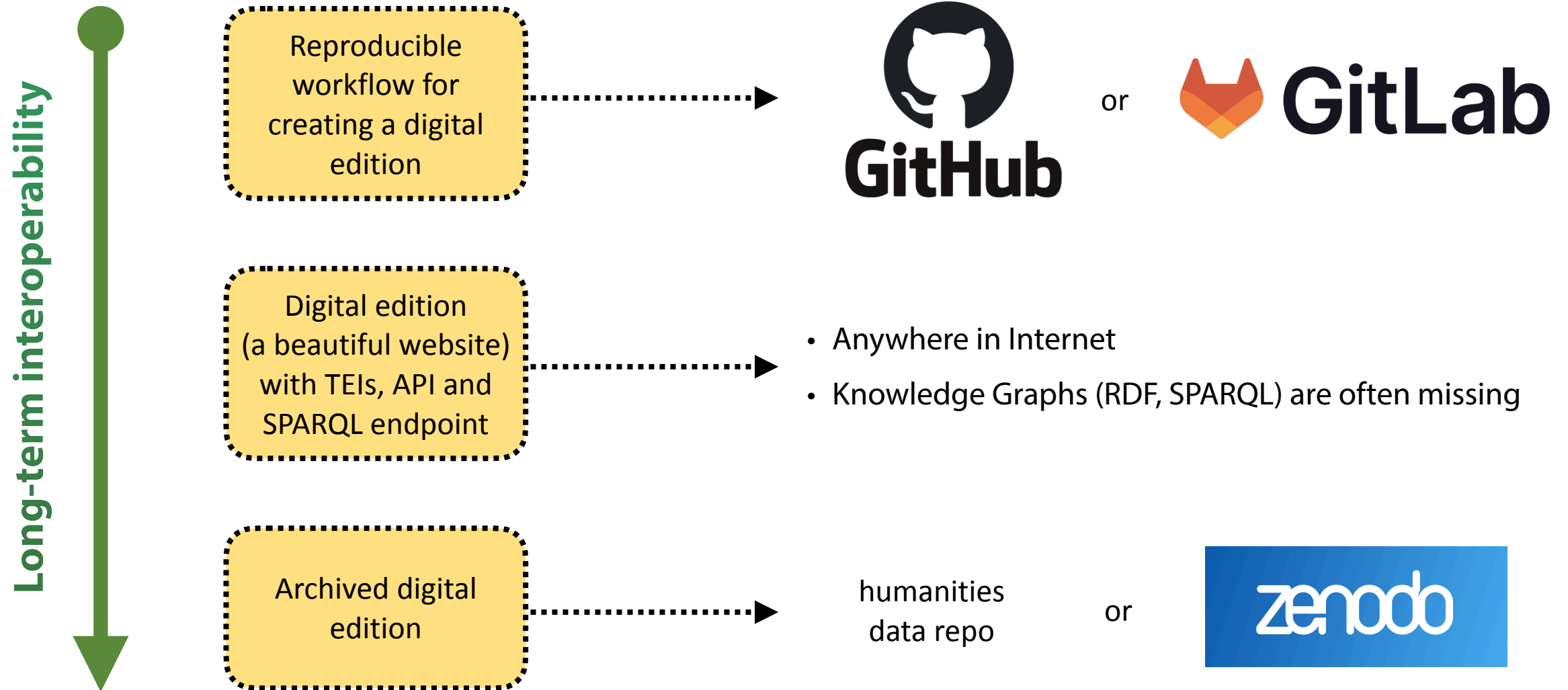


## Anything else?

Yes, knowledge graphs, please

## Practical tips

- Create a knowledge graph from your metadata (*including your registry of entities*)
- Provide access to your RDF-metadata via SPARQL endpoints. This enables reusing metadata by both humans and machines
- Provide RDF-metadata dumps



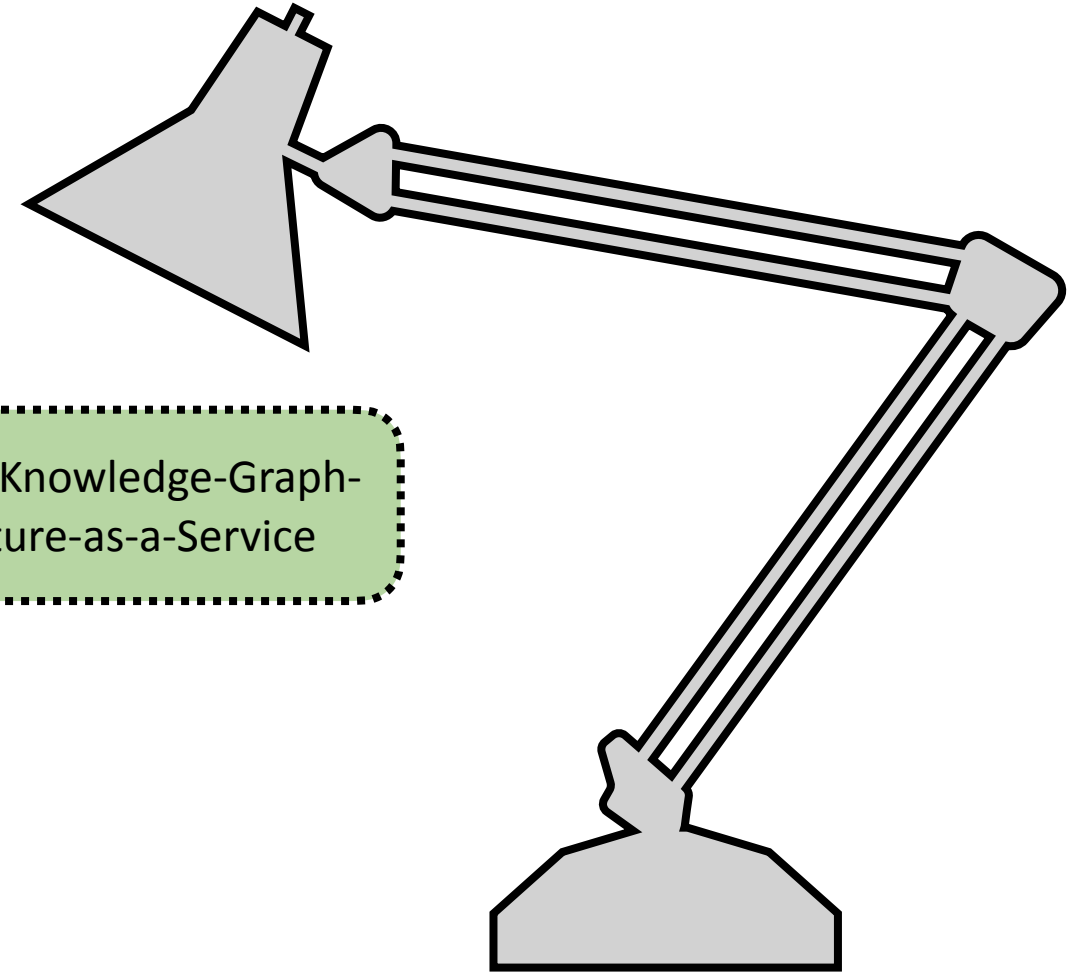


Limited manpower in a research project

Relatively complex technology stack

Inertia

NFDI-driven Knowledge-Graph-Infrastructure-as-a-Service



# Knowledge Graph Infrastructure (KGI): Idea

idea:

easily reusable by KGI providers

easily usable by KG creators

consultancy on KG creation

goal:

to satisfy the knowledge graph needs of everyone in the German research data landscape: NFDI consortia, institutions and potentially all researchers

**KGI4NFDI**

target group:

researchers

data centers

institutions

consortia

# Knowledge Graph Infrastructure (KGI): Where to learn more?

KGI Base Service proposal:

<https://docs.google.com/document/d/1kPrj-G3FYeo2QkxJUyokCwd6eI3VN5Uo8UnUZFDR9MU>

NFDI WG “Knowledge Graphs” in Section “(Meta)data, Terminologies, Provenance”

Mailing list of WG KGs:

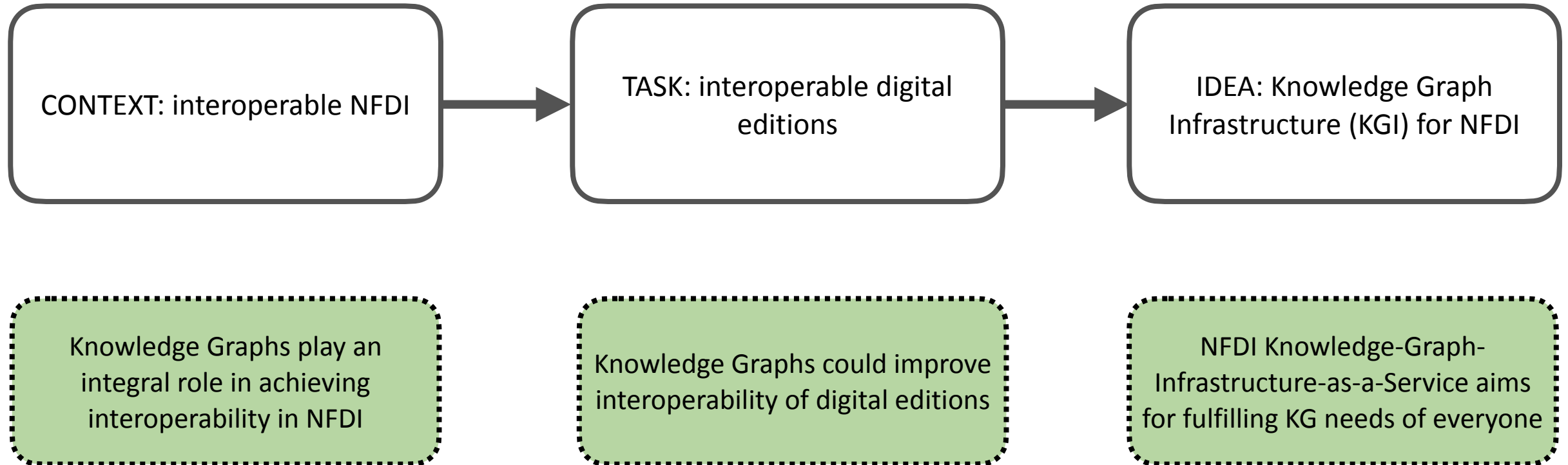
<https://lists.nfdi.de/postorius/lists/section-metadata-wg-kg.lists.nfdi.de>

Charter of WG KGs:

<https://doi.org/10.5281/zenodo.7515324>

Questions?

email to [renat.shigapov@uni-mannheim.de](mailto:renat.shigapov@uni-mannheim.de)





1. Kraft, S. et al.: Nationale Forschungsdateninfrastruktur (NFDI), E-Science-Tage 2021: Share Your Research Data, Heidelberg: heiBOOKS, 2022, p. 374-383. <https://doi.org/10.11588/heibooks.979.c13752>
2. Kraft, S., et al. (2021). Nationale Forschungsdateninfrastruktur (NFDI) E. V.: Aufbau Und Ziele. Bausteine Forschungsdatenmanagement, Nr. 2. <https://doi.org/10.17192/bfdm.2021.2.8332>
3. Hartl, N., Wössner, E. & Sure-Vetter, Y. Nationale Forschungsdateninfrastruktur (NFDI). Informatik Spektrum 44, 370–373 (2021). <https://doi.org/10.1007/s00287-021-01392-6>
4. Diepenbroek, M., et al. (2021). Sektionskonzept Common Infrastructures zur Einrichtung einer Sektion im Verein Nationale Forschungsdateninfrastruktur (NFDI) e.V. Zenodo. <https://doi.org/10.5281/zenodo.5607490>
5. Koepler, O., et al. (2021). Sektionskonzept Meta(daten), Terminologien und Provenienz zur Einrichtung einer Sektion im Verein Nationale Forschungsdateninfrastruktur (NFDI) e.V. Zenodo. <https://doi.org/10.5281/zenodo.5619089>
6. Stocker, M., et al. (2022). Knowledge Graphs - Working Group Charter (NFDI section-metadata). Zenodo. <https://doi.org/10.5281/zenodo.7515324>
7. Shigapov, R. (2022). Knowledge graphs in BERD and in NFDI. Focused Tutorial on Capturing, Enriching, Disseminating Research Data Objects. Use Cases from Text+, NFDI4Culture and BERD@NFDI, Mannheim and online. Zenodo. <https://doi.org/10.5281/zenodo.7373258>
8. Shigapov, R. (2021). Wikibase Knowledge Graphs for Data Management & Data Science. Data Literacy Snacks 2021 in BERD@BW. <https://madoc.bib.uni-mannheim.de/59865>