Der BERD@BW-Wissensgraph für offene Firmendaten mit Wikibase

FAIR knowledge-graph-based research data management

Dr. Renat Shigapov, Dr. Irene Schumm, Markus Herklotz & Lars Oberländer

Mannheim University Library, 04.03.2021

Outline

Motivation

Part 1: Creating

Part 2: Scaling

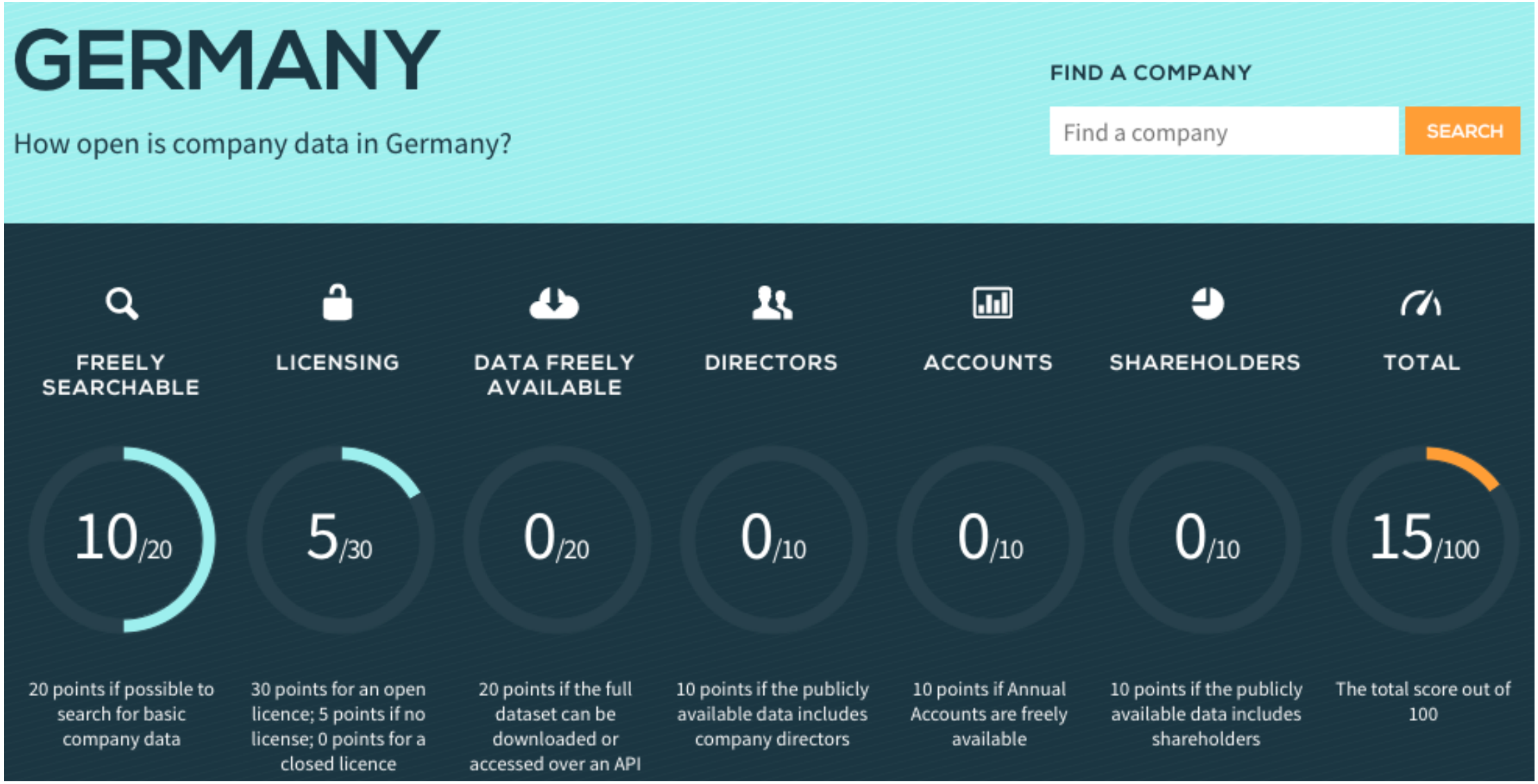
Part 3: Using

Conclusions

instance of

15 100

The open company data index for Germany is 15/100

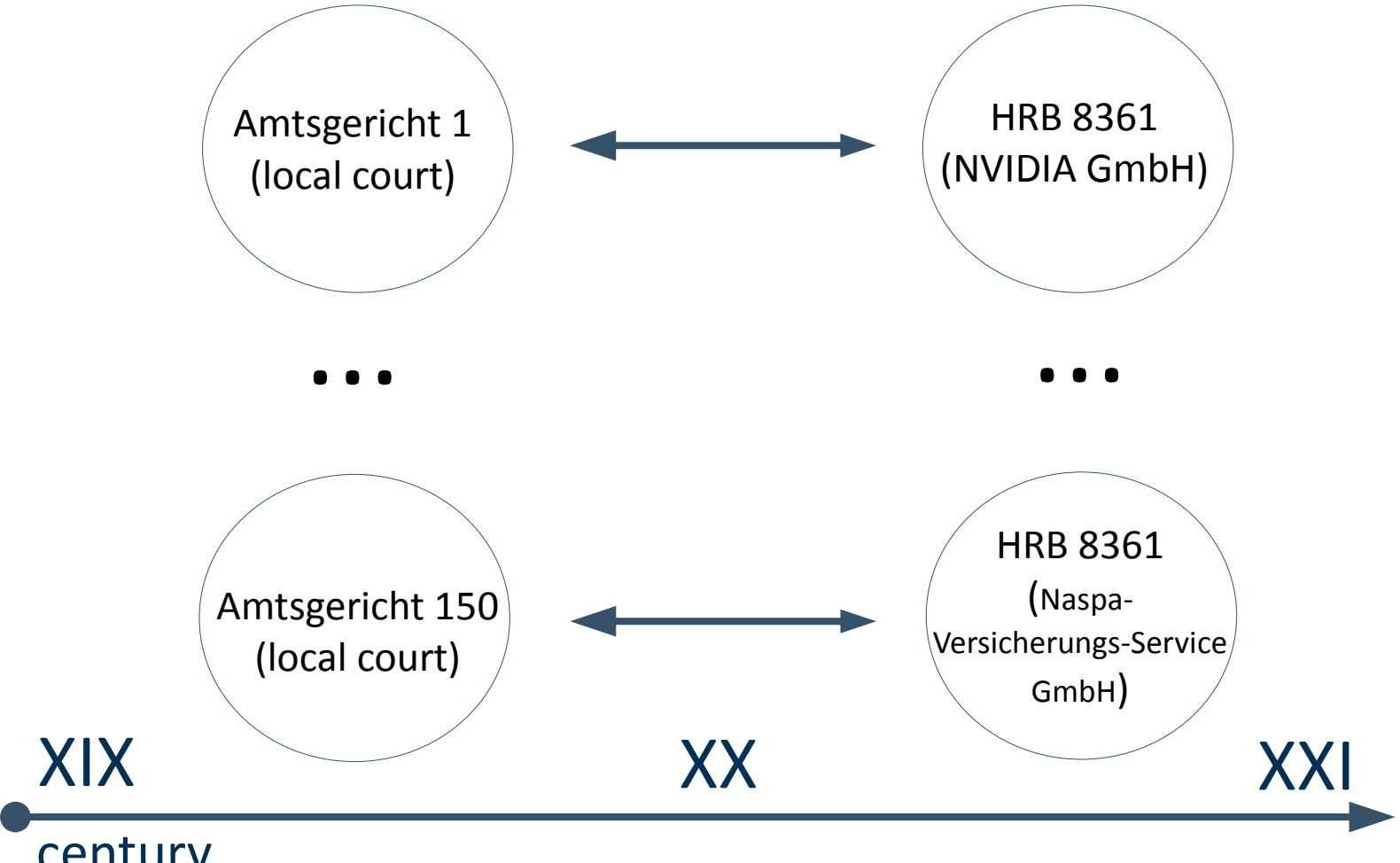


Source: http://registries.opencorporates.com/jurisdiction/de

The curse of German company data

Many registration authorities

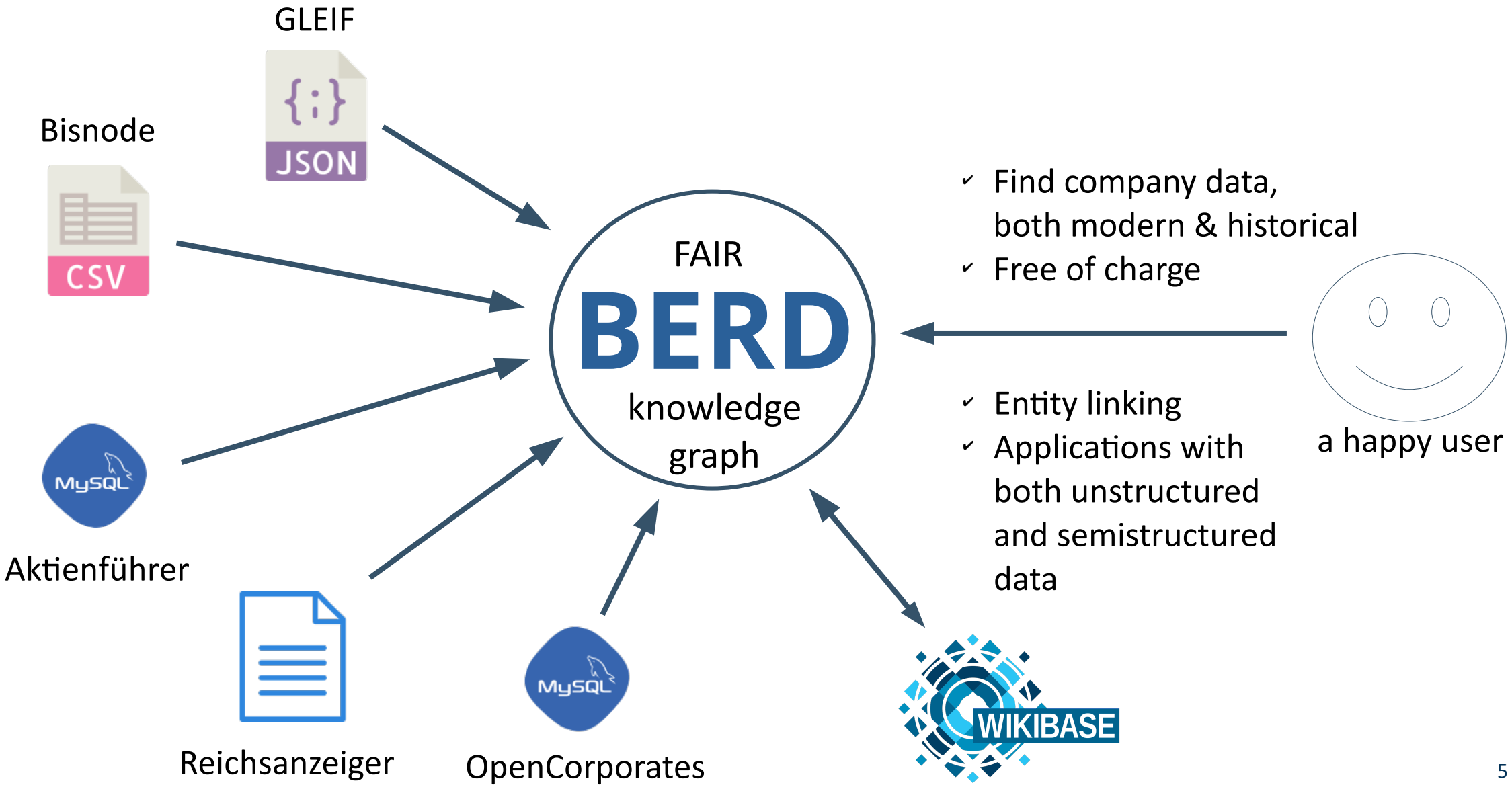
Non-unique company identifiers



The historical & modern German company data ARE NOT:

- ☹ Findable
- ☹ Accessible
- ☹ Interoperable
- ☹ Reusable

Solution: BERD knowledge graph of German companies



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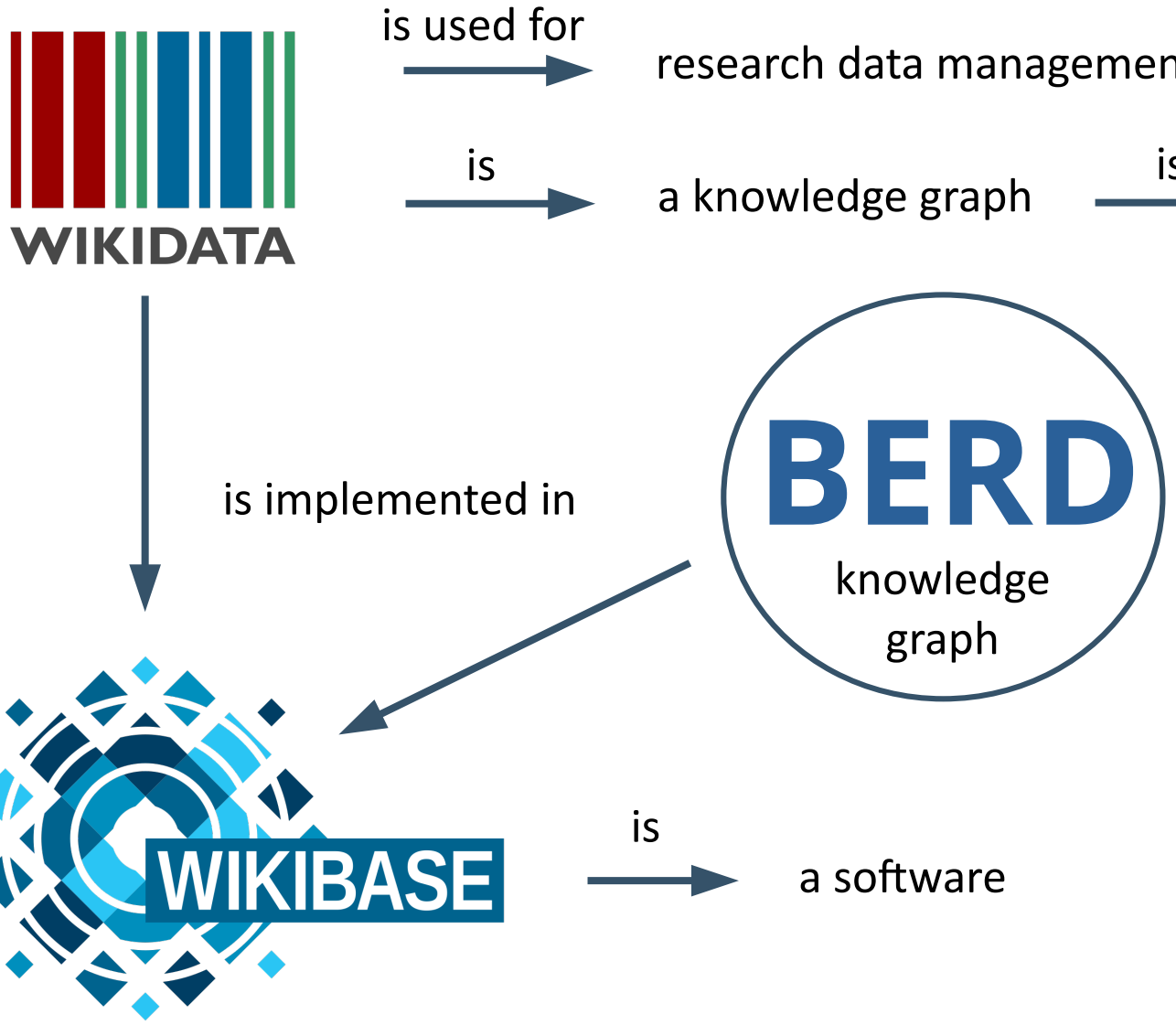
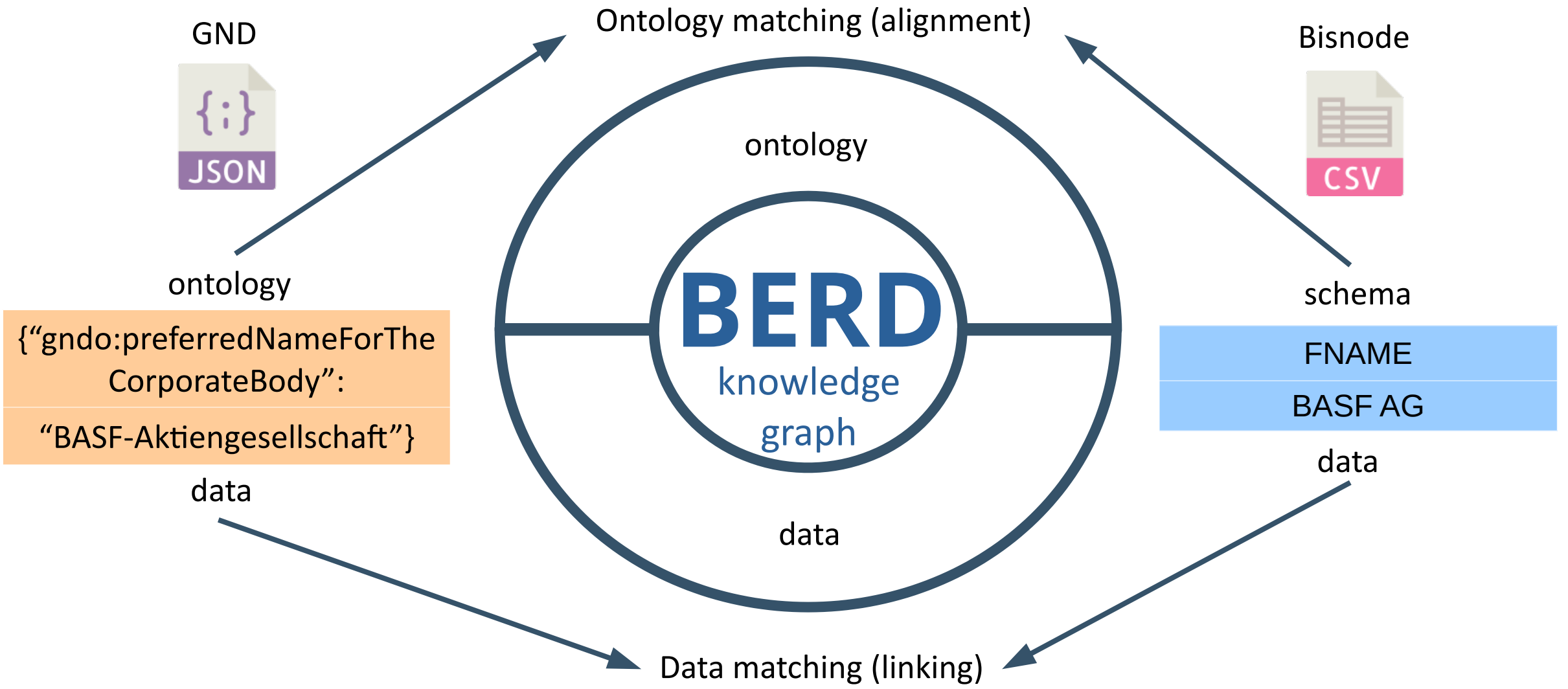
Wikibase, Wikidata & knowledge graphs



Why knowledge-graph-based research data management?

- ✔ State-of-the-art technology
- ✔ Reach data modeling
- ✔ Statement-level provenance
- ✔ Unstructured & structured data
- ✔ 18 datatypes
- ✔ Data science applications

Knowledge graph = ontology + data



Filling BERD ontology and BERD data via Wikibase API

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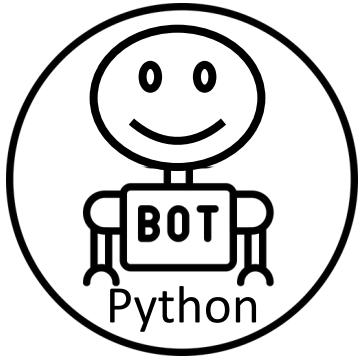
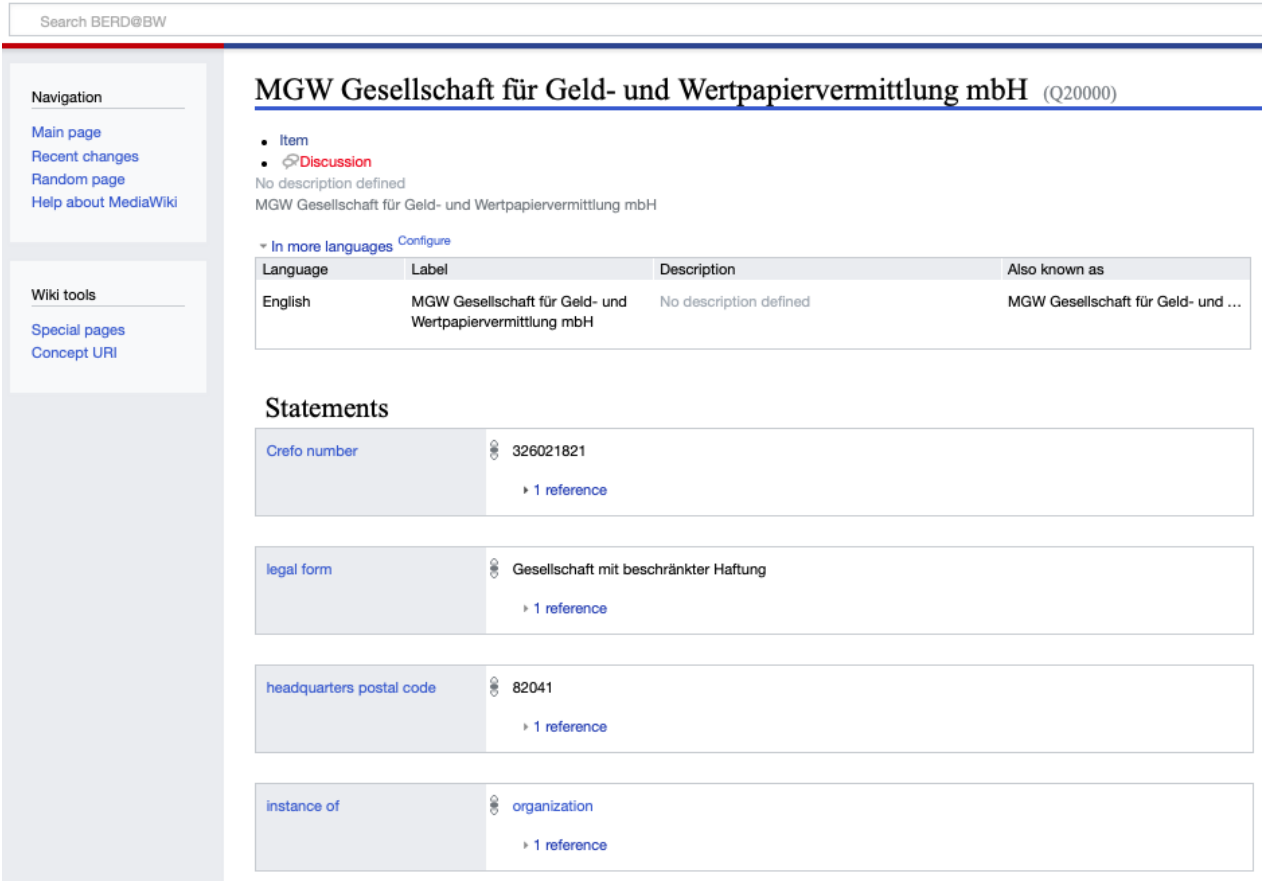
Company page
RDF export



Wikibase API

BERD knowledge graph

SPARQL endpoint
Data analysis and export



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Towards a large-scale knowledge graph

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BERD
knowledge
graph

10000-100000 entities

1000000-10000000 entities

- More ontology alignment
- More data matching
- More data integration
- More data filling

A small problem with big data

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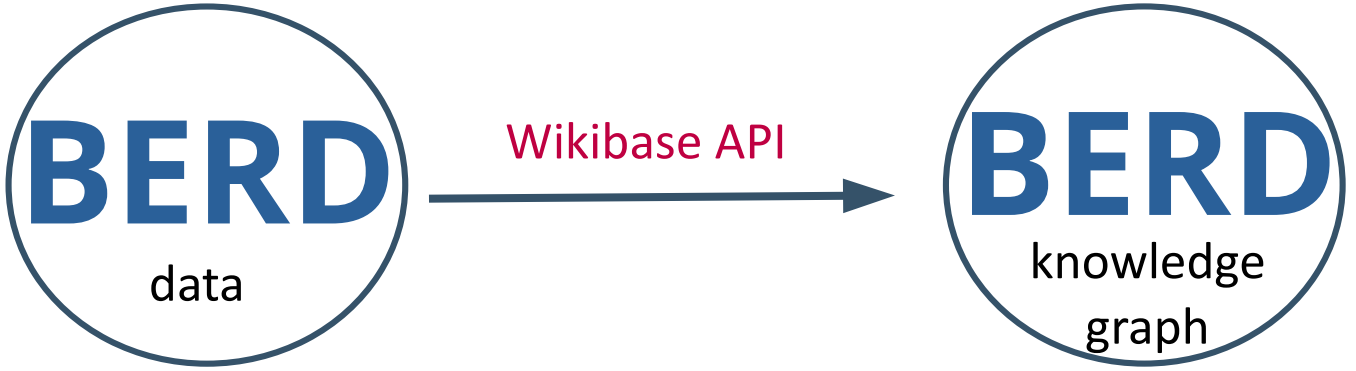
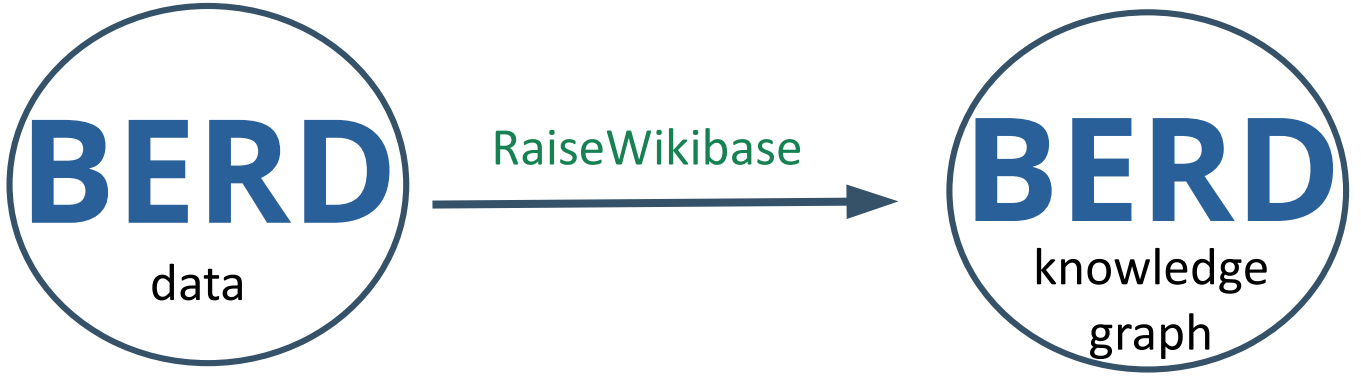
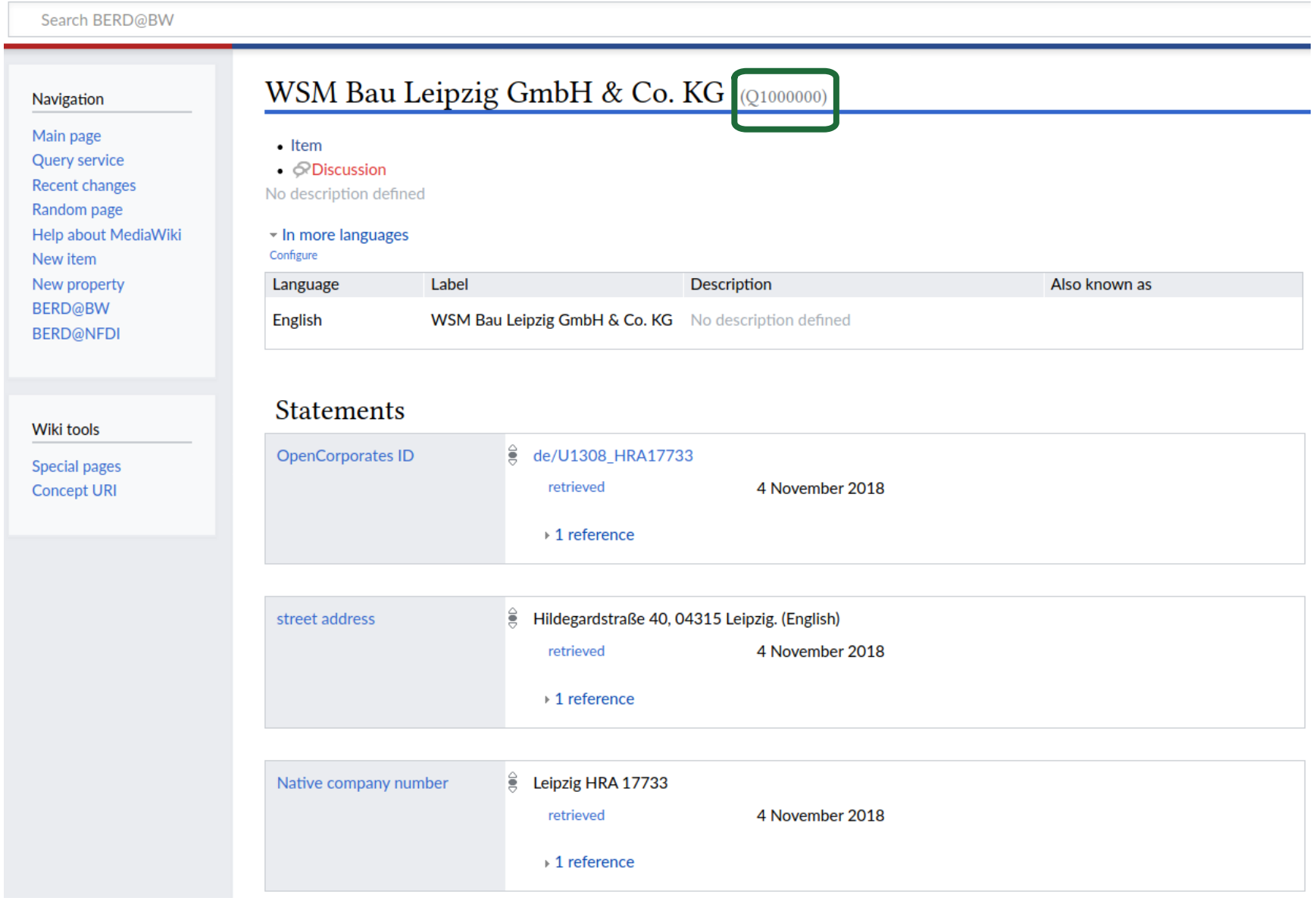
A million edits of entities per 2-12 days





A million edits of entities per 1-2 hours

Towards the large-scale BERD knowledge graph



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Wikibase as a backend for search services

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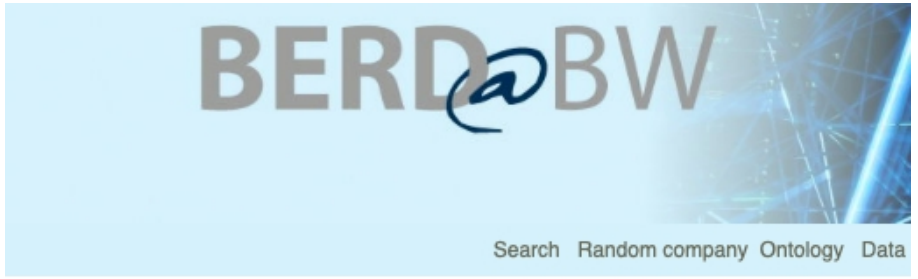
BERD
knowledge graph

company | state | city | address | Search

LEI | ISIN or WKN | Creditreform-ID | Handelsregister

min. employees | max. employees | legal form | SIC industry



Graubner Industrie-Beratung

Copy | CSV | Excel | PDF | Print | JSON

Property	Value
also known as	Graubner Industrie-Beratung GmbH
Crefo number	318147083
Handelsregister: court	Amtsgericht Stuttgart
Handelsregister: court, code & number	Amtsgericht Stuttgart HRB 331527
headquarters address	Schwimmbadstr. 26
headquarters city	Bad Herrenalb
headquarters fax number	(07083) 524914

Semantic annotation, entity linking & data integration

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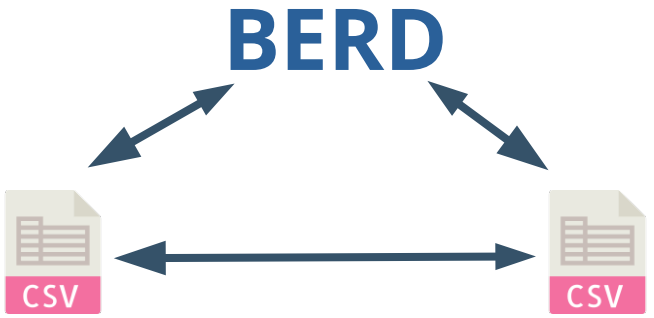
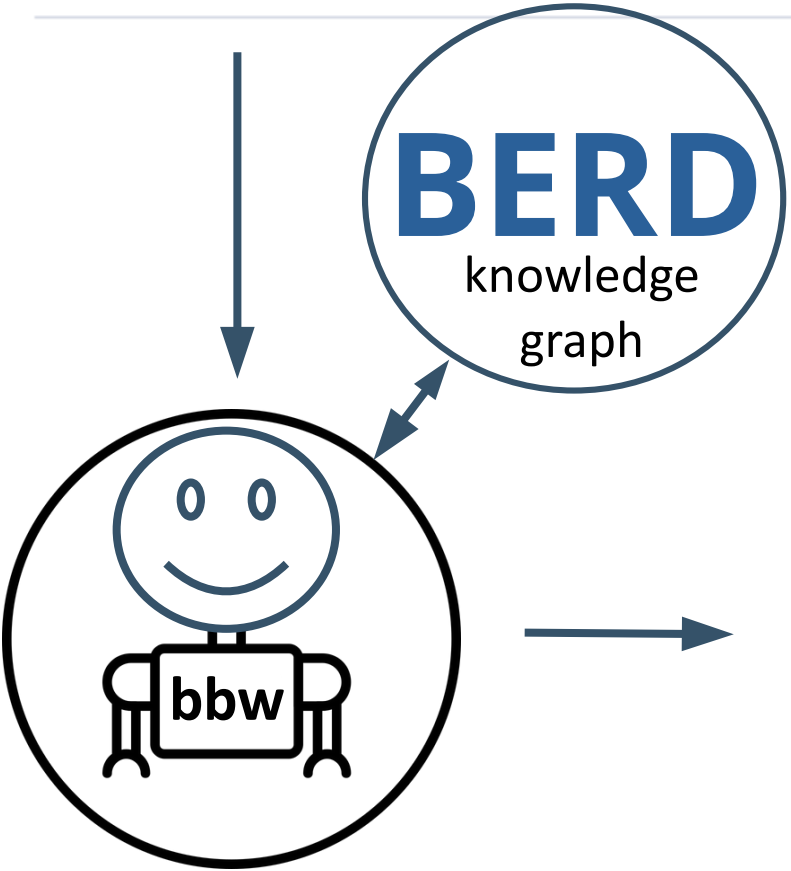
1	Deutsche Telekom	mobile phone industry	Bonn	1994-01-01	https://www.telekom.com/
2	Lufthansa	air transport	Cologne	1953-01-01	https://www.lufthansa.com
3	SAP SE	software development	Walldorf	1972-04-01	https://www.sap.com





1	Deutsche Telekom	mobile phone industry	Bonn	1994-01-01	https://www.telekom.com/
2	Lufthansa	air transport	Cologne	1953-01-01	https://www.lufthansa.com
3	SAP SE	software development	Walldorf	1972-04-01	https://www.sap.com
property		industry	headquarters location	inception	official website
type	business	industry	urban municipality of Germany		
datatype		WikibaseItem	WikibaseItem	Time	Url

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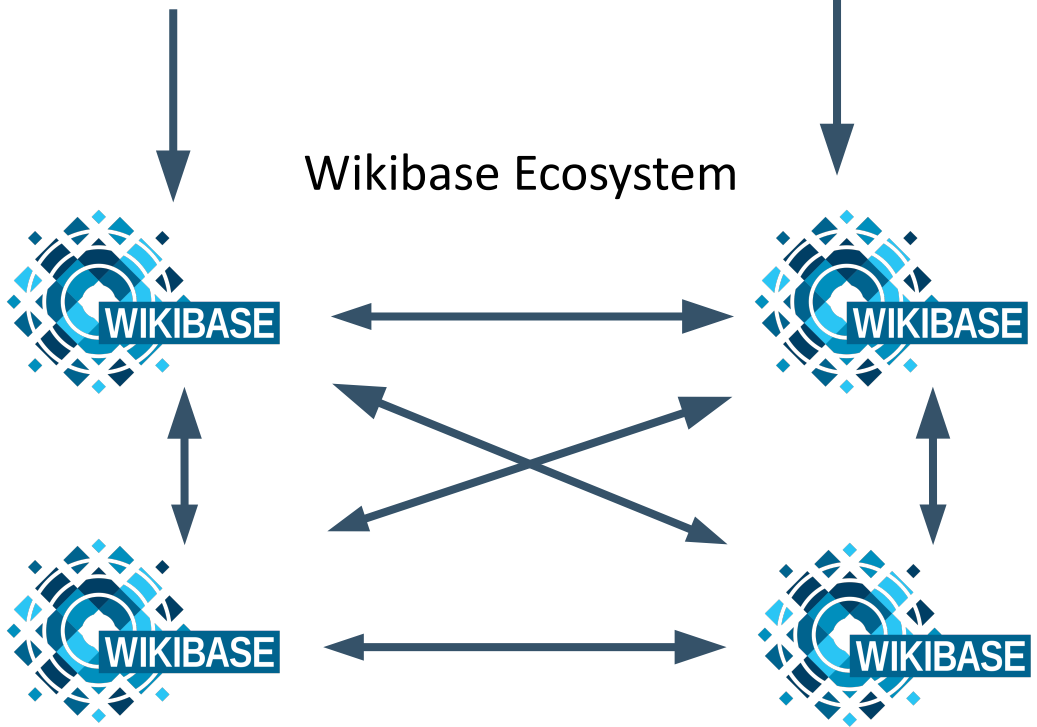
Towards the open company data index = 100

A domain-specific knowledge graph of German companies

BERD

A general-purpose knowledge graph

WIKIDATA



Conclusions

☺ FAIR BERD knowledge graph

☺ State of the art research data management

☺ FAIR **B**usiness, **E**conomic and **R**elated **D**ata

FAIR BERD software:
https://www.berd-bw.de/services-tools