

Towards Legal Interoperability in International Data Spaces: A systematic Literature Review and Open Issues

VictorBenoiston, patricioalencar

This systematic literature review aims to retrieve the state-of-the-art regarding Legal Interoperability within International Data Spaces (IDS), adhering to the European Interoperability Framework approach, and aligning the IDS architecture and policies.

Planning

To capture the intricacies of diverse data exchange policies regarding enterprise interoperability while upholding the data sovereignty.

PICOC

- **Population:** IDS Participants, Data Governance Specialists and Protection Officers
- **Intervention:** Ontology, Knowledge graph, taxonomy
- **Comparison:** Doesn't apply
- **Outcome:** Efficiency, Clarification, Automation
- **Context:** International Data Space, Industrial Data Space, Business Ecosystem.

Research Questions

1. What is Legal Interoperability in IDS?
2. What is the conceptual relationship between Data Sovereignty and Legal Interoperability regarding IDS?
3. What is the current representation of legal moments in Data/Usage Policies within IDS and related data ecosystems?
4. What are the legal challenges within the IDS domain?
5. Are there gaps and opportunities for research and development regarding Legal Aspects in IDS?

Keywords and Synonyms

Keyword	Synonyms
Data sovereignty	Control Over Data, Power
International Data Space	Industrial Data Spaces
Ontology	Conceptual model, Knowledge Graph,

Taxonomy

Search String

("ONTOLOGY"OR "CONCEPTUAL MODEL" OR "TAXONOMY" OR "KNOWLEDGE GRAPH") AND ("SOVEREIGNTY" OR "ENTERPRISE INTEROPERABILITY") AND ("INTERNATIONAL DATA SPACE" OR "INDUSTRIAL DATA SPACE" OR "BUSINESS ECOSYSTEM")

Sources

- ACM Digital Library (<http://portal.acm.org>)
- El Compendex (<http://www.engineeringvillage.com>)
- IEEE Digital Library (<http://ieeexplore.ieee.org>)
- Manual
- Science@Direct (<http://www.sciencedirect.com>)
- Scopus (<http://www.scopus.com>)
- Springer Link (<http://link.springer.com>)

Selection Criteria

Inclusion Criteria:

- English Written Papers
- Primary Studies
- Studies about data sovereignty
- Studies about legal interoperability
- Studies addressing ontologies

Exclusion Criteria:

- 10 years time span
- Duplicated Studies
- Other Literature reviews
- Other languages but English
- Studies that do not involve data exchange or data negotiation

Quality Assessment Checklist

Questions:

- Does the model refer to any data regulation act? (E.g.: LGPD, GDPR)
- Does the paper address IDS specifically? Does it cite Industrial Data Spaces or other Industrial Ecosystems?
- Does it mention any legal aspect on the data usage?
- Does the paper consider or discuss the applicability of the concept in an international context?
- Does the paper address the specific topic of data sovereignty or scattered concepts i.e.: internet sovereignty, digital sovereignty or cyber sovereignty?

- Does the paper propose or utilize an ontological approach?
- Does the paper provide empirical evidence (e.g.: case studies or practical examples) for validation?
- Does the paper cover any aspect of legal interoperability?
- Does the first author have at least one publication about data sovereignty?
- Are potential biases or limitations addressed and discussed?

Answers:

- Yes
- Partial
- No

Data Extraction Form

- Authors
- Publication Date
- Venue of publication
- Paper citations
- Type of publication
- Does the case or dataset mentioned in the paper cover any multi country scenario?
- Does the study involve any law expert? (In the validation step, or in any other phase of the research)
- What is the main goal of the paper?
- Does the paper present a formal representation of the proposed approach? (E.g.: Constructs, Taxonomies, Conceptual models, Frameworks)
- Is the paper somehow related to governmental initiatives to regulate private data usage?
- Does it refer to any kind of Interoperability framework? (E.g.: EIF, IEF)
- Additional notes
- Regarding the European Interoperability Framework (EIF), what layer are focused on the paper? (Address the 1st and 2nd most cited respectively). (I.e.: Legal, Organizational, Semantical or Technical).
- What kind of business ecosystem does it address? I.e.: IDS, Industrial Data Space, Other
- What is its associated domain?
- Are any future works stated?
- Referred nationality / Facility's nationality
- Does it mention FAIR principles? What is the approach?

Conducting

Digital Libraries Search Strings

ACM Digital Library:

("ONTOLOGY"OR "CONCEPTUAL MODEL" OR "TAXONOMY" OR "KNOWLEDGE GRAPH")
AND ("SOVEREIGNTY" OR "ENTERPRISE INTEROPERABILITY") AND ("INTERNATIONAL
DATA SPACE" OR "INDUSTRIAL DATA SPACE" OR "BUSINESS ECOSYSTEM")

IEEE Digital Library:

("ONTOLOGY"OR "CONCEPTUAL MODEL" OR "TAXONOMY" OR "KNOWLEDGE GRAPH")
AND ("SOVEREIGNTY" OR "ENTERPRISE INTEROPERABILITY") AND ("INTERNATIONAL
DATA SPACE" OR "INDUSTRIAL DATA SPACE" OR "BUSINESS ECOSYSTEM")

Science@Direct:

("ONTOLOGY"OR "CONCEPTUAL MODEL" OR "TAXONOMY" OR "KNOWLEDGE GRAPH")
AND ("SOVEREIGNTY" OR "ENTERPRISE INTEROPERABILITY") AND ("INTERNATIONAL
DATA SPACE" OR "INDUSTRIAL DATA SPACE" OR "BUSINESS ECOSYSTEM")

Springer Link:

("ONTOLOGY"OR "CONCEPTUAL MODEL" OR "TAXONOMY" OR "KNOWLEDGE GRAPH")
AND ("SOVEREIGNTY" OR "ENTERPRISE INTEROPERABILITY") AND ("INTERNATIONAL
DATA SPACE" OR "INDUSTRIAL DATA SPACE" OR "BUSINESS ECOSYSTEM")

Imported Studies

- **ACM Digital Library:** 33
- **El Compendex:** 3
- **IEEE Digital Library:** 23
- **Manual:** 14
- **Science@Direct:** 40
- **Scopus:** 3
- **Springer Link:** 23