

# Bridging Repositories, ELNs and Semantic Data Management: A LinkAhead-based use case for 3D Additive Manufacturing

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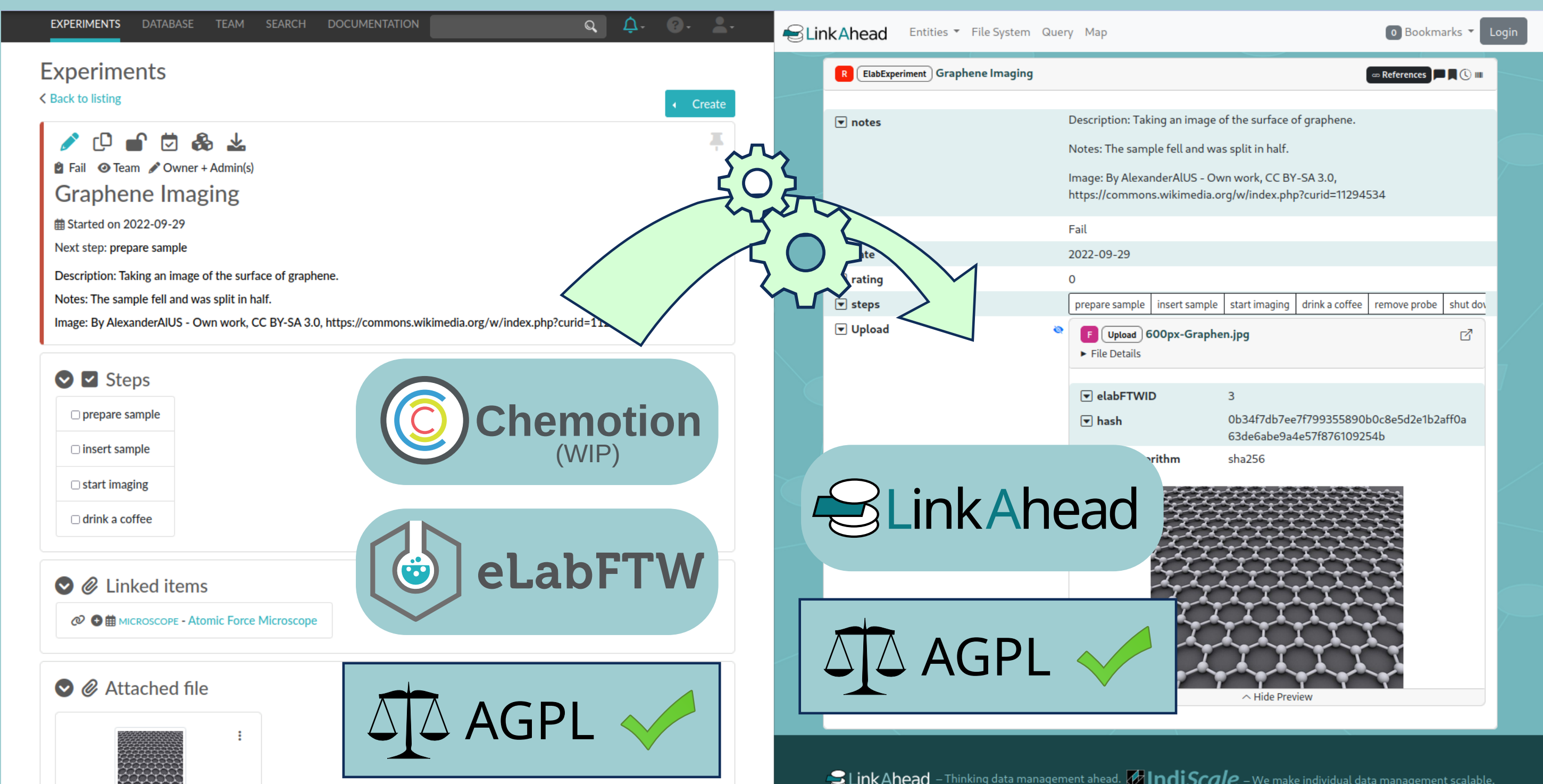
Interdisciplinary collaborative scientific networks often rely on a multitude of different software systems for data storage and data exchange. Keeping data findable and in sync between different sites, working groups and institutes can be challenging. We developed a solution based on the open source software LinkAhead that combines meta data from different repositories into a single research data management system (RDMS). (...) This enables us to import meta data from four different repositories and ELN systems used by the Cluster of Excellence 3D Matter Made to Order (3DMM2O).



Full Abstract

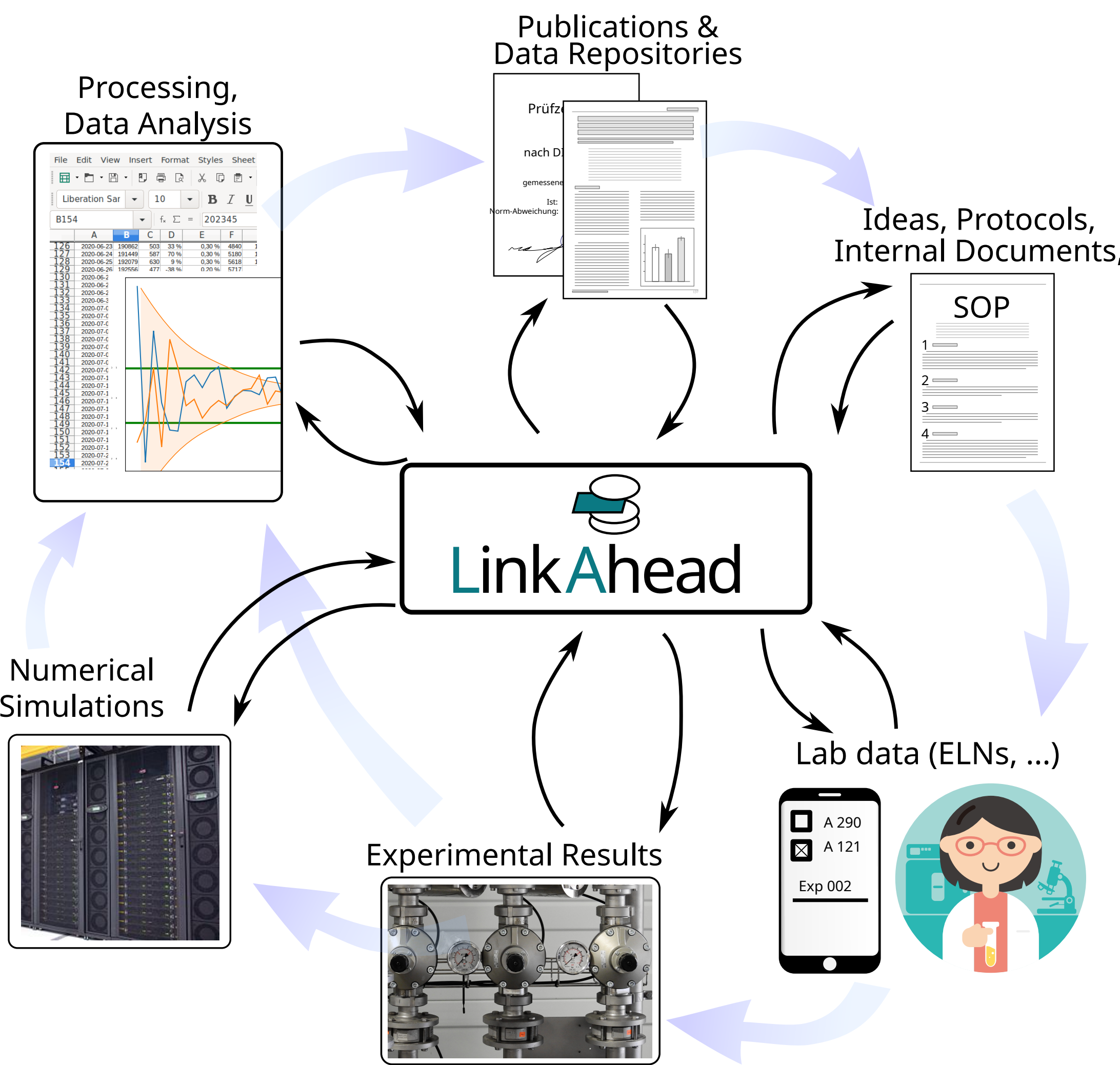
## ELN integration: key to user acceptance

**ELNs (Electronic lab notebooks):** device and experimental settings, semi-structured **Data:** Critical for filtering and analysis  
**Approach:** Automatic integration of ELN data into data management system



## Data lifecycle

**Valuable data** = Interoperable, reusable data. LinkAhead **integrates** data from all lifecycle stages and connects the data sets via **semantic links**.



## LinkAhead's data model

- Inheritance structure of RecordTypes.
- Records (= data) may choose to have additional Properties.
- Graded importance system for Properties.

## Data Hub

## Crawler

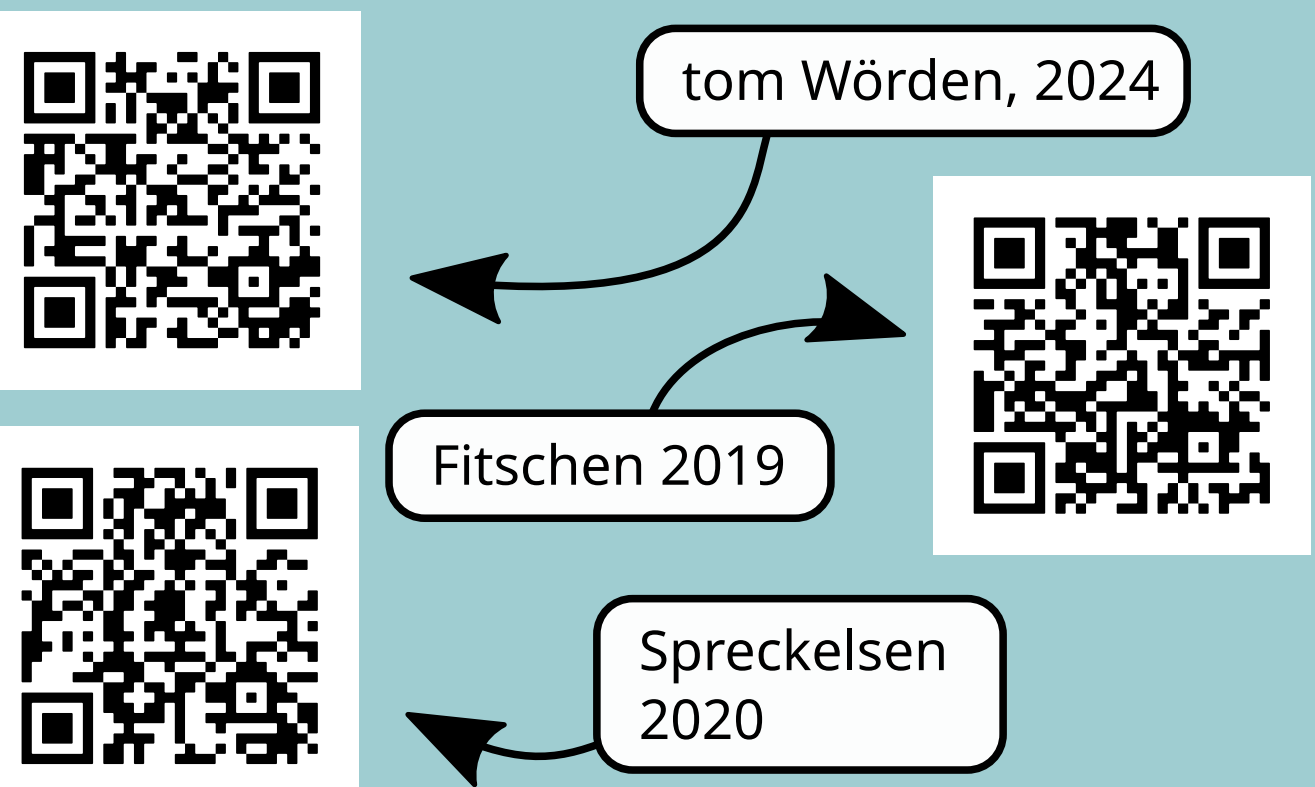
## RADAR

## heiDATA

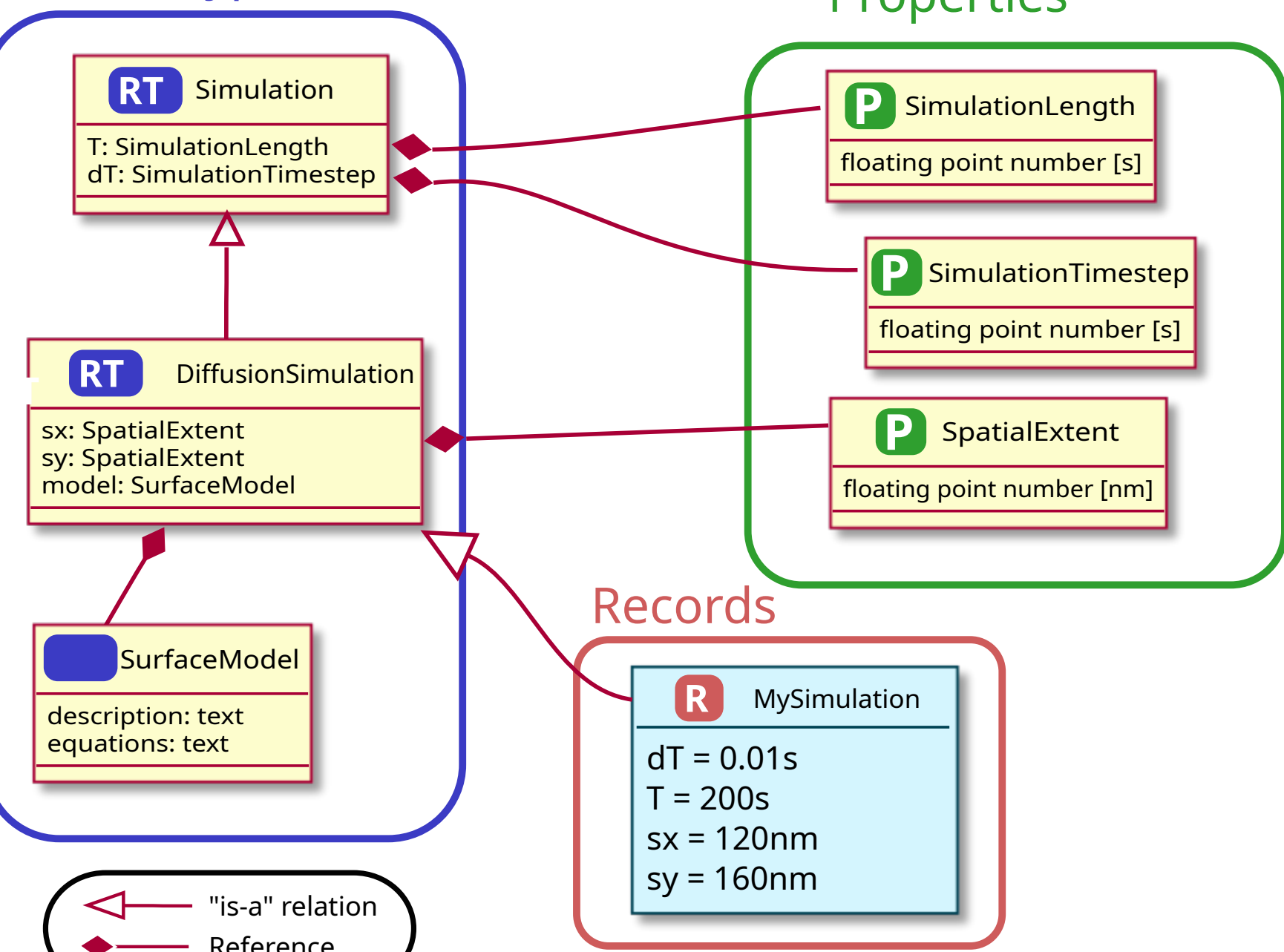
## Datacite OAI-PMH

### Publications

1. ChaosDB — Research Data Management ..., Fitschen et al., Data, 2019
2. Guidelines for a Standardized ..., Spreckelsen et al., Data, 2020
3. Mapping Hierarchical File Structures ..., tom Wörden et al., Data, 2024



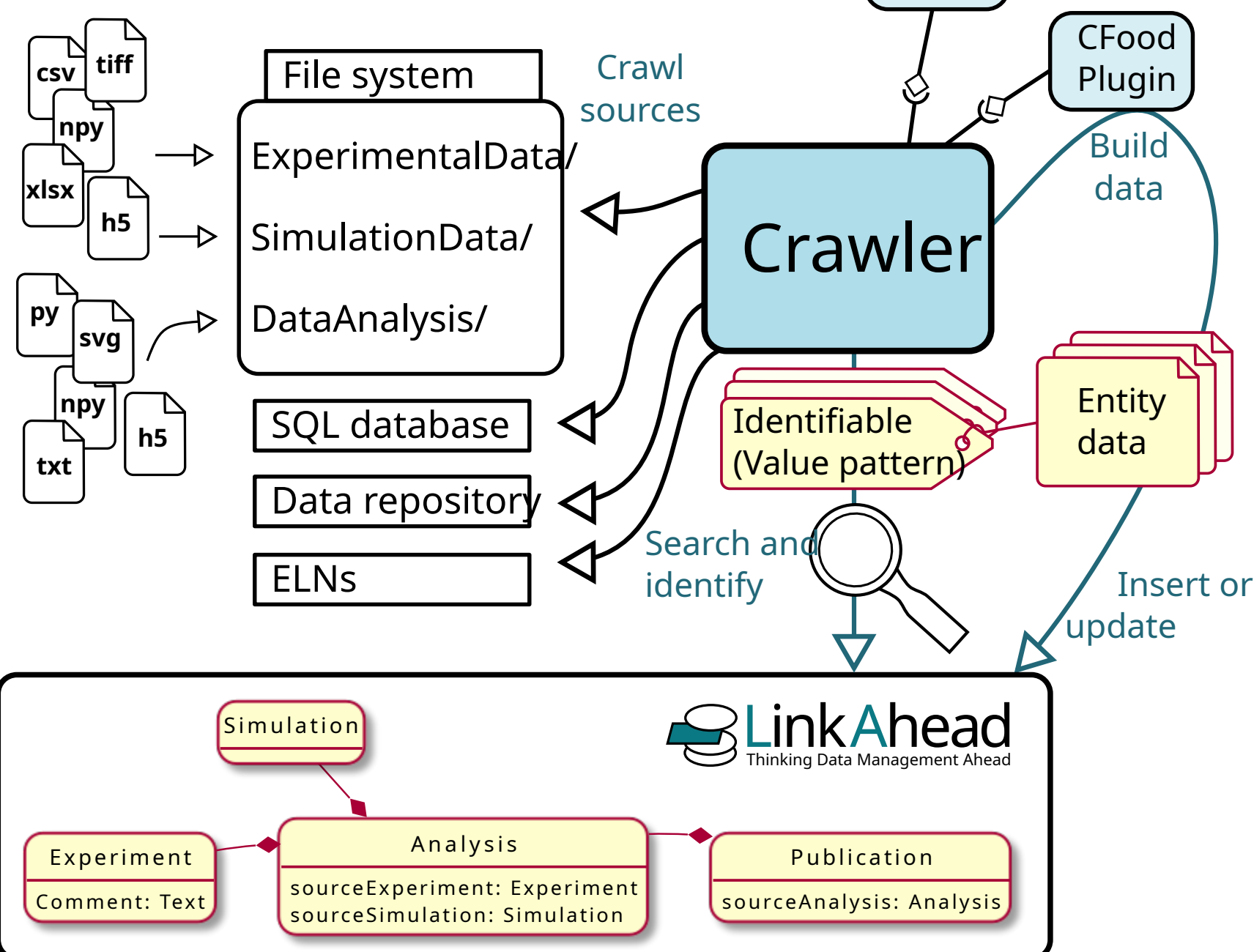
### Record Types



## Automated data crawler

- Framework for **automated data integration**:
- Find new or changed raw data.
- Simplifies integration with **existing systems**.
- Based on Python library.

### Data sources



## LinkAhead is Open-Source!

License: AGPLv3, <https://gitlab.com/linkahead>  
Code review and security audits by IndiScale GmbH, which also provides services for LinkAhead.

Sourcecode on [gitlab.com](https://gitlab.com)

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**3D MATTER**  
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