Factsheet

Biodiversity
Community
Integrated
Knowledge
Library

BiCIKL

LifeBlock — Federated and Semantic Search in RI´s

What is LifeBlock?

Lifeblock is a blockchain-based tool developed by LifeWatch ERIC, tailored specifically for the conservation, recording, and management of biodiversity and ecosystem data. By leveraging the immutable nature of blockchain, Lifeblock ensures the integrity, provenance, and traceability of the information on any research product (e.g., data, services, networks, publication, etc.) stored, thus upholding the FAIR principles — Findability, Accessibility, Interoperability, and Reusability — that are vital for scientific data.

Beyond just providing a storage solution, Lifeblock offers robust search capabilities that allow researchers and users to effectively navigate and retrieve data, not just from its own infrastructure but also from other research infrastructures. This broadens the scope and applicability of the data, making it more valuable and usable for diverse research needs. Additionally, its semantic search feature enhances the tool's precision and relevance in data retrieval, recognizing and understanding the context and relationships within the data, and providing more accurate and contextually relevant results.

One of the most striking features of the implementation of LifeBlock in LifeWatch ERIC is that it allows the user to navigate into the data values, not just the metadata.

The importance of federated search

Federated search across multiple research infrastructures, like GBIF (Global Biodiversity Information Facility), DiSSCo (Distributed System of Scientific Collections), LTER (Long Term Ecological Research network), Zenodo, and LifeWatch ERIC's metadata catalogue, is crucial for several reasons:

1. Comprehensive Data Retrieval
2. Time Efficiency
3. Data Interoperability
4. Increased Collaboration
5. Data Redundancy & Verification
6. Reducing Data Silos
7. Enhanced Discoverability:
8. Supporting FAIR Principles
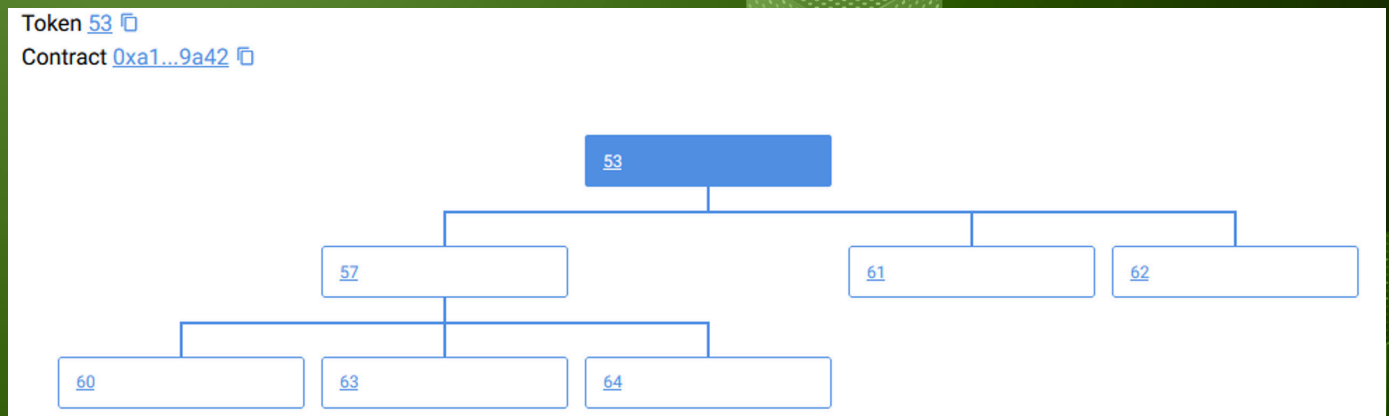
Real capture of a traceability of a dataset in Lifeblock.

Why semantic Search is so important?

Semantic search is a significant advancement over traditional keyword-based methods because it understands the context and intent behind a user's query, not just the literal words. Regular searches might miss relevant results if the user's phrasing doesn't match specific keywords in the database. In contrast, semantic search recognizes synonyms, relationships, and varied phrasings, making it more efficient and user-friendly. Especially in the realm of big data, where understanding relationships between data points is crucial, semantic search offers more nuanced and relevant results. Essentially, by focusing on understanding the meaning rather than just matching words, semantic search provides more accurate and comprehensive results in our information-rich age.

Semantic databases and blockchain for the Development of SKG

Semantic search and blockchain technology significantly enhance the development of Scientific Knowledge Graphs (SKGs) for biodiversity and ecosystem data and other research products. Semantic search captures the relationships and context within data, allowing for a more interconnected representation in SKGs. On the other hand, blockchain's transparency ensures that this data is traceable and tamper-proof, fostering trust. Together, they transform SKGs from mere data repositories to trusted, context-rich knowledge networks, ensuring accurate and verifiable scientific insights.