POnto: An ontology for the Polkadot multichain ecosystem

Approach proposal and roadmap

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MOBR SYSTEMS

Structure

Research overview

POnto discussion

Next steps

Research overview

Initiative towards enhancing integration and communicability in the Polkadot ecosystem

First step: mapping, structuring and formalizing concepts and relationships in an ontology

Long term goal: to build a CNL and querying engine to support relevant analytics use cases

Research questions

General

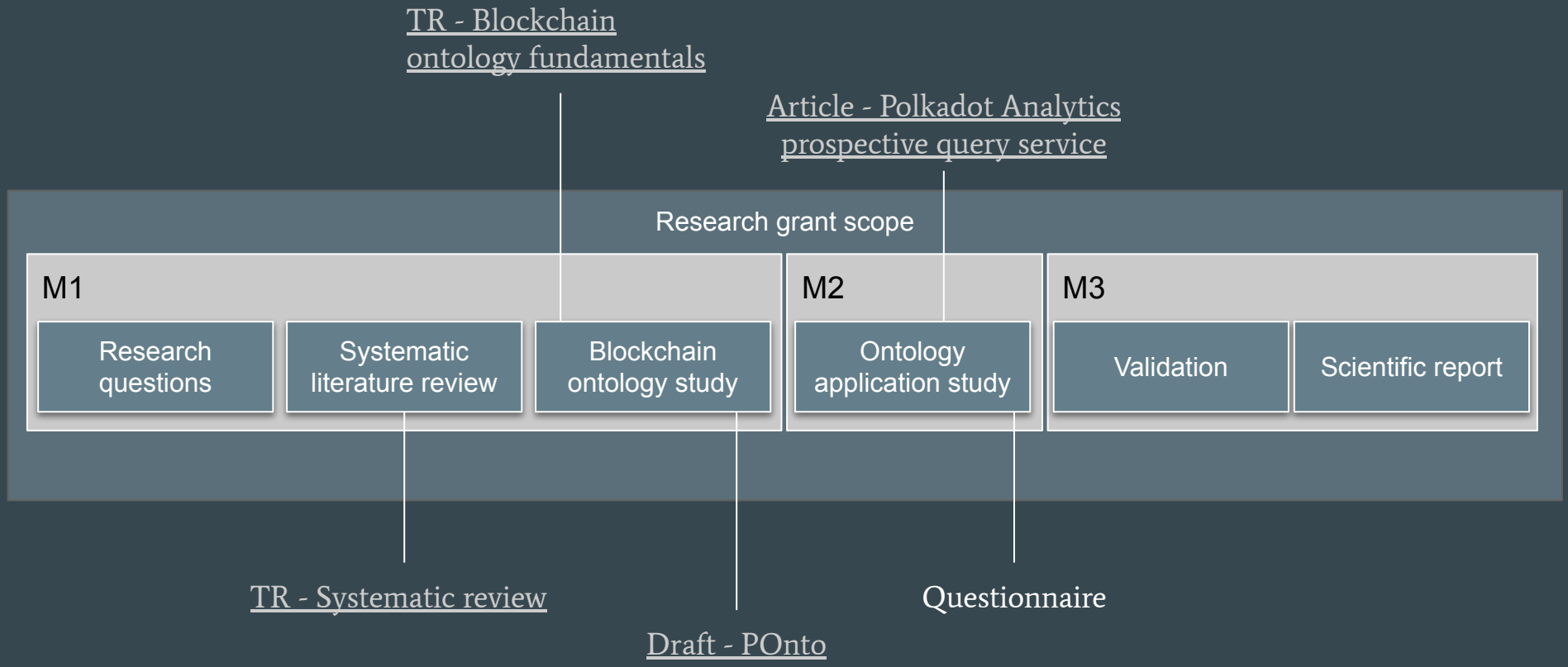
How a knowledge-oriented approach may benefit the communicability, integration, usage and development of blockchains?

Specific

How ontology-supported development impacts design and building of Polkadot's parachains and cross-chain communication?

Long-term research questions

Methodology



Fundamentals

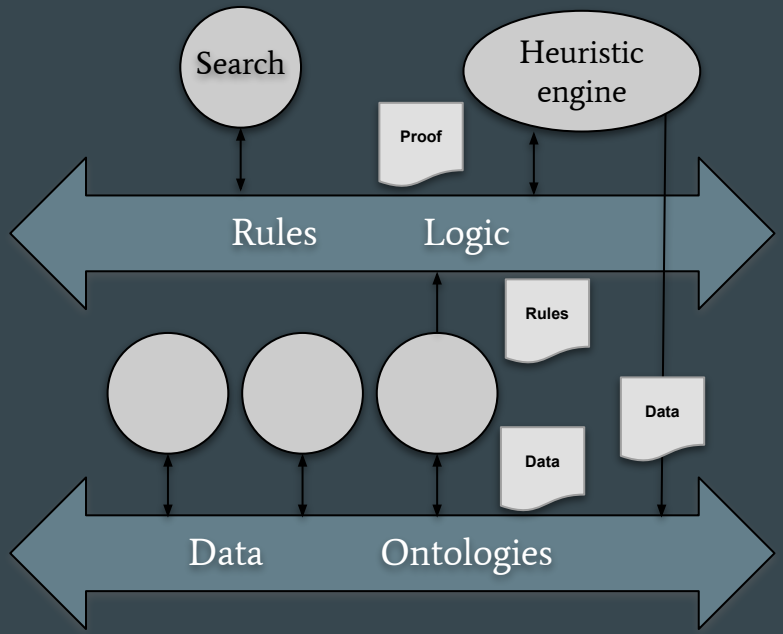
Ontologies are essential in Web2's semantic technologies stack

Conceptual framework for describing, sharing and reusing data in different applications and domains

Enhance **communicability** among stakeholders, support for **reasoning** and data **integration**

Support for representing and defining domain categories (TBox) and instances (ABox)

- Properties, relationships between concepts, data and entities



The "semantic web bus", as originally envisioned by Berners-Lee

https://www.w3.org/2000/Talks/1206-xml2k-tbl/slide14-0.html

Fundamentals

Why to develop an ontology?

Noy and McGuiness, (2001)

Share common understanding of the information structure among people and/or software agents

Enable reuse of domain knowledge

Make domain assumptions explicit

Analyze domain knowledge

POnto

Tools

- Visual Studio Code
- Protégé
- Jena and Fuseki
- http://mobr.ai/ponto

POnto

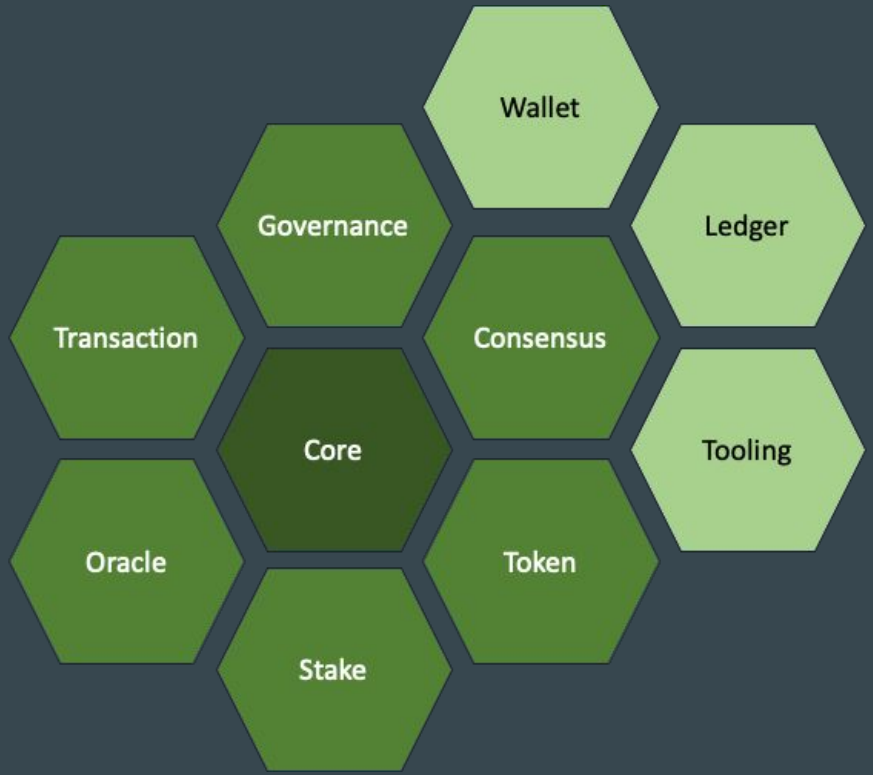
Design goal

1. Modular organization
2. Main concepts (completeness)
3. Relationships (formal understanding)
4. (a)kbc

POnto

Metrics

- 10 Modules
- 449 Triples
- 50 Classes
- 25 Individuals
- 58 Properties



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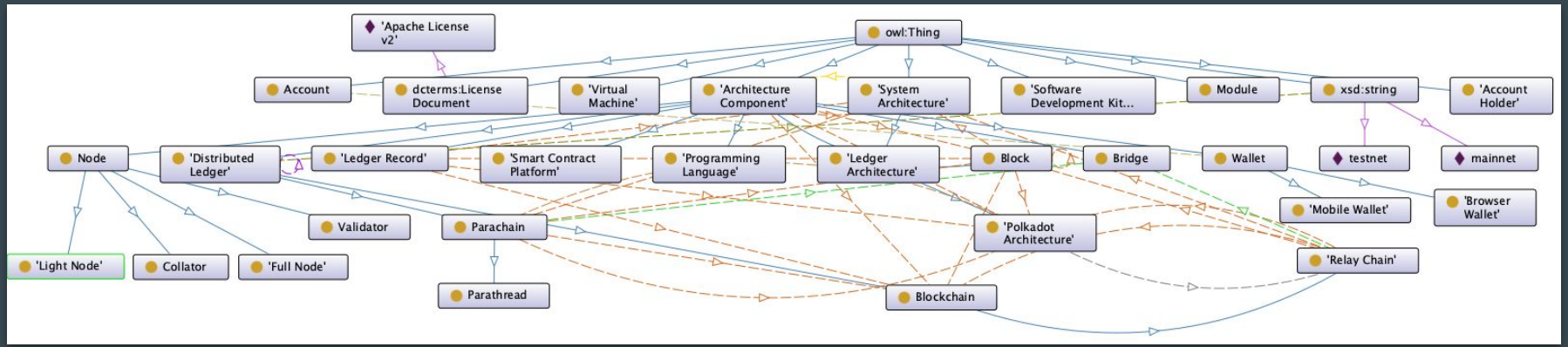
Core Module



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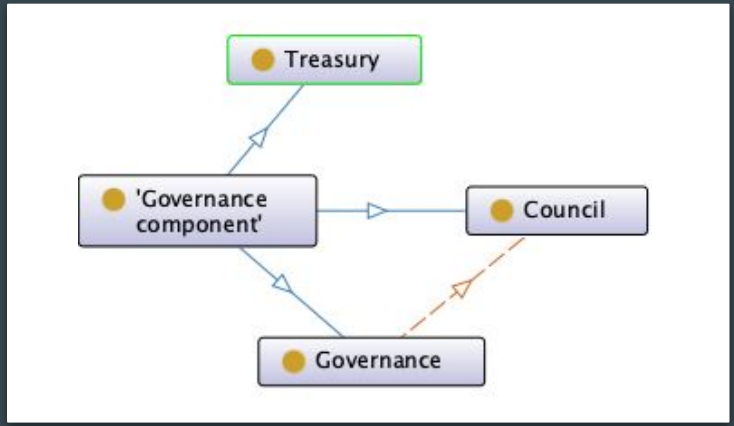
Governance Module



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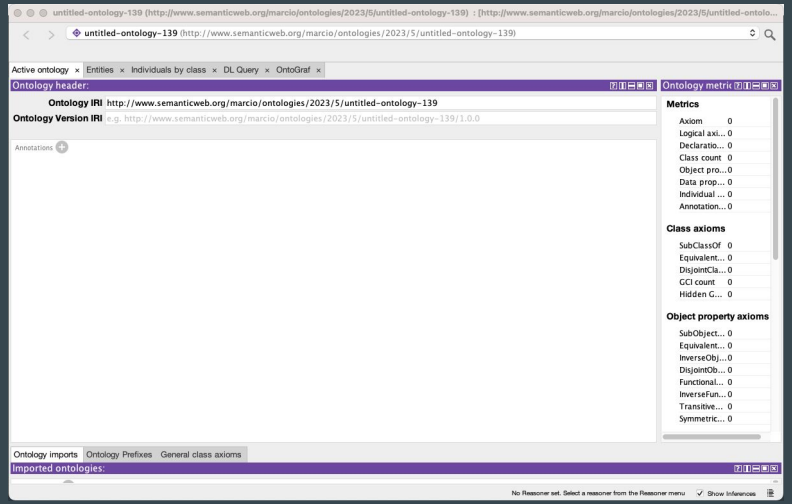
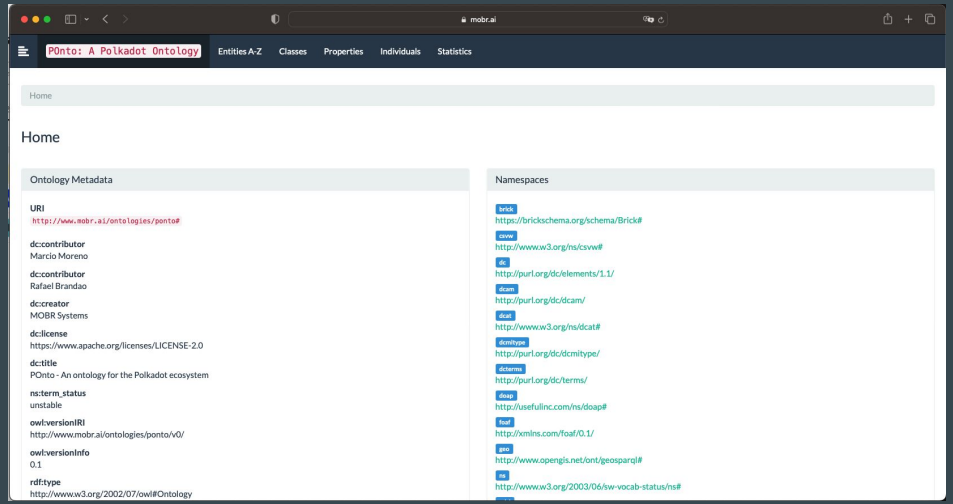
Browsing the ontology using Protégé and Ontospy documentation





POnto

Continuous Evolution

- Community contributions
- Scientific paper
- Roadmap

Questionnaire discussion

Goal is to assess the perceived value and effectiveness of a query service by the community

Insights for building a CNL to support querying

Validation of the proposed approach

General and/or Polkadot-specific

Communication strategy

Deadline target definition

Roadmap

Creation of the conceptual framework

Knowledge base construction: script to extract data from the Polkadot ecosystem and align the data as individuals of the POnto ontology

Specification of a controlled natural language (CNL) that will use the POnto ontology

Query engine creation that supports users specifying queries using the CNL

Roadmap

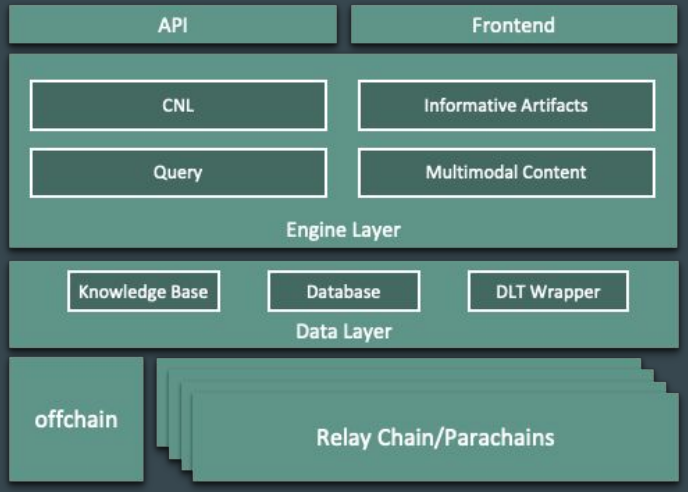
Polkadot Analytics

CNL Engine parses input queries and assists query completion supported by a Knowledge Base with the POnto Ontology

Queries are processed to a structured format by the Query Engine component

Informative Artifacts Engine manages creation of multimodal artifacts, for visualizing query results
Support for composition on user dashboards

Access through web UI frontend and API offering



Proposed architecture for the Polkadot Analytics

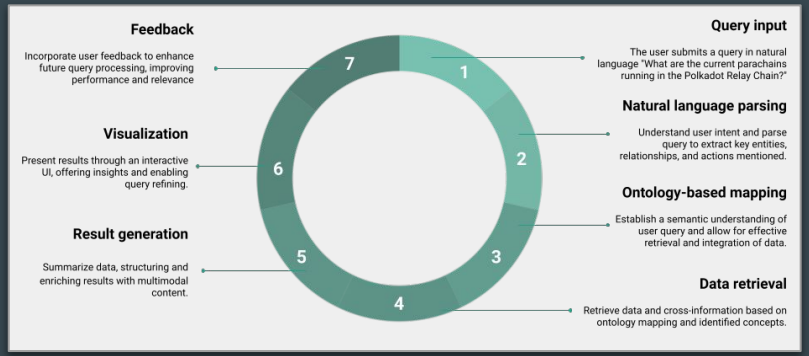
Roadmap

Polkadot Analytics

Support for broad range of queries and data visualization strategies

Query results structured as artifacts with multimodal content, representing data results and summarization aspects

Composability and integration of informative artifacts to create user dashboards



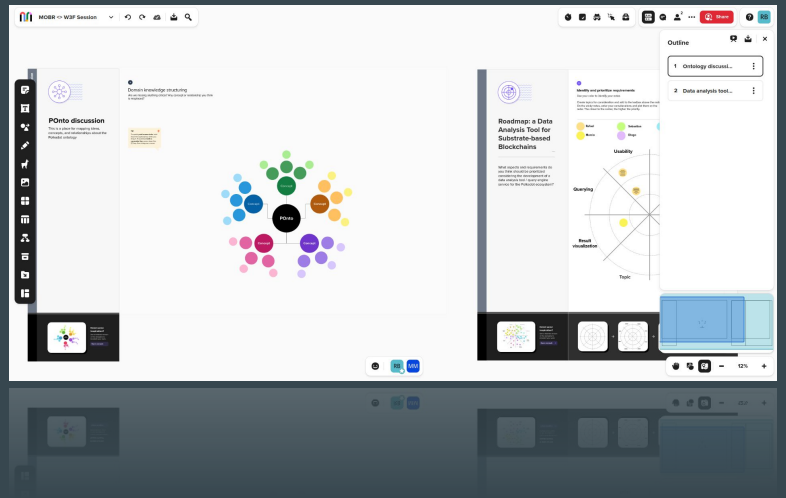
Envisioned query processing in Polkadot Analytics

Mural activity

Mural session to support brainstorming and discussion

POnto concept mapping

Analytic tool requirements prioritization



Reflections and action items

Engagement with domain experts
- Approach validation

Questionnaire
- Should be focused on Polkadot ecosystem
- Pilot-tested with domain experts
- Ready to be deployed in the wild

Action items

➢ Support for new concepts referred in suggested queries

➢ Improvements over the POnto modeling
- Modules: Network, Pallet, Account, and others

➢ Considerations for the envisioned query engine

Thank you!