Ontology Requirements Specification Document

Purpose

The purpose of building the blockchain-based patterns ontology is to provide a knowledge base representing the academic state-of-the-art on blockchain-based software patterns. This knowledge base is intended to be used along with the design of blockchain-based applications to guide the software architect in the choice of possible usable patterns in the context of the application to build.

Scope

The ontology only focuses on blockchain-based patterns identified in a previous study, as well as their relations with each other.

Implementation Language

The ontology has to be implemented using OWL (Ontology Web Language), and the Turtle language.

Intended End-Users

User 1. Software architect interested in the design of a blockchain-based application based on software patterns.

User 2. Blockchain researcher who wants to document himself about the state of the art of blockchain-based patterns.

User 3. Software researcher who aims to extend existing pattern ontologies with the newest blockchain-based patterns.

Intended Uses

Use 1. Explore the state-of-the-art of blockchain-based patterns.
Use 2. Find the relations between an existing blockchain-based pattern and another.
Use 3. Identify all the blockchain-based patterns that address a certain design problem when designing blockchain-based applications.

Ontology requirements

Non-functional requirements

NFR1. The ontology must be written in English.
NFR2. The ontology must support the addition of blockchain-based patterns following the publication of new patterns in the literature.

Functional requirements

CQG1 - Proposed pattern identification

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- What is the context and problem associated with the “Anchoring to blockchain” from (Liu et al. 2020) pattern?
- What is the solution proposed by the “Anchoring to blockchain” from (Liu et al. 2020) pattern?

CQG2 - Relations between patterns

- What are the related patterns of the “Anchoring to blockchain” from (Liu et al. 2020) pattern?
- From what patterns the pattern “Embedded permission” from (Xu. et al 2018) can benefit?
- What are the patterns required for the implementation of the “Snapshotting” from (Bandara et al. 2020) pattern?
- From what pattern the pattern “Oracle data provider” from (Wohrer et al. 2020) is issued?
- What are the variants of the “Delegate list” from (Liu et al. 2020) pattern?
- What are all the patterns proposed in the literature for the “Off-chain data storage” pattern?
- What is the pattern targeted proposed in (Xu et al. 2018) under the name “Oracle”?

CQG3 - Pattern recommendation

- What patterns can I use to guarantee the security of a smart contract?