# COSMOS 2024


# I-ADOPT:
# A systematic Way to Represent Variables

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COSCMOS Conference 2024, April 11, 2024, I-ADOPT, cite as: https://osf.io/ce9gy

# I-ADOPT Framework – A Semantic Broker

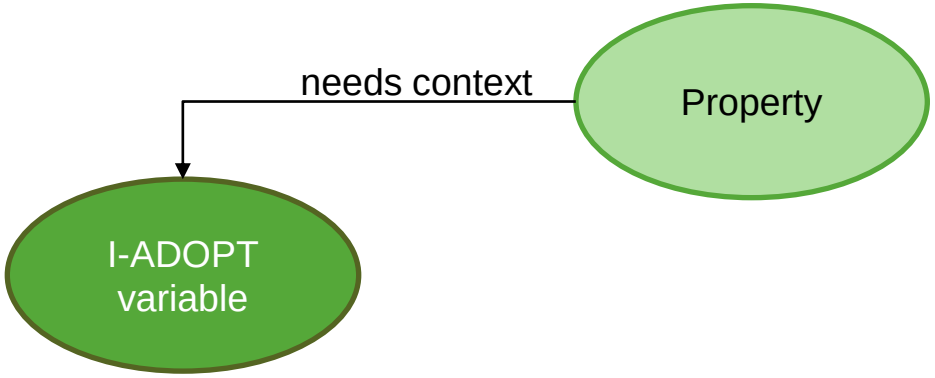
I-ADOPT provides a **standardized descriptions for variables** and supports **interoperability** between existing terminologies by

- ❏ Enabling **mappings** between variable descriptions **across terminologies**
- ❏ Requiring **no change to existing structures**
- ❏ Adding rich (**human-readable and machine-actionable**) descriptions with **qualified references**

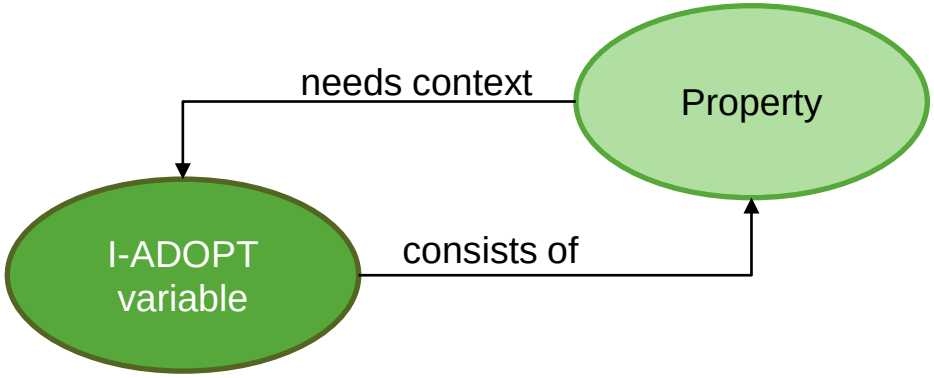
COSCMOS Conference 2024, April 11, 2024, I-ADOPT, cite as: https://osf.io/ce9gv

# Descriptions of Properties

# Contextualised properties -> observable properties -> I-ADOPT variables



# Contextualised properties -> observable properties -> I-ADOPT variables

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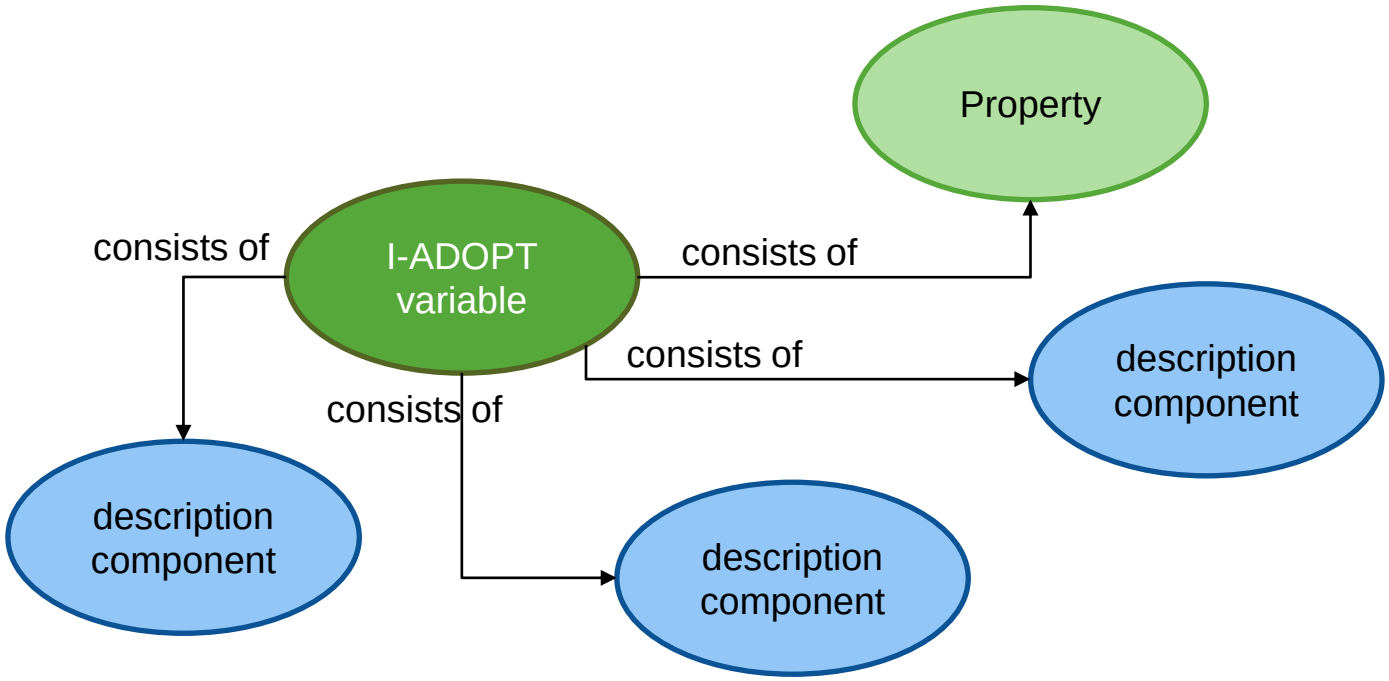
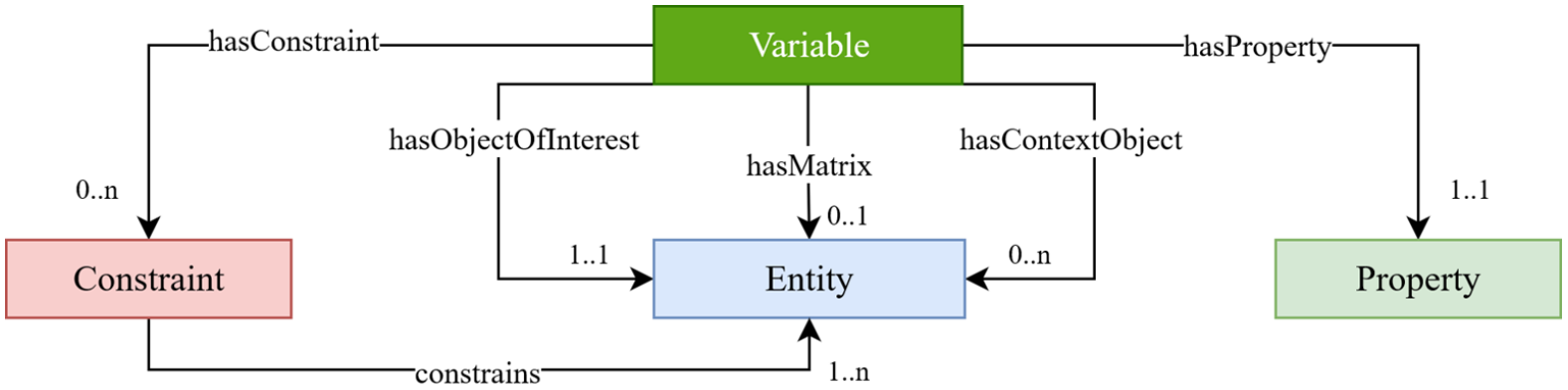
# I-ADOPT variable consists of various description components



# The I-ADOPT Ontology

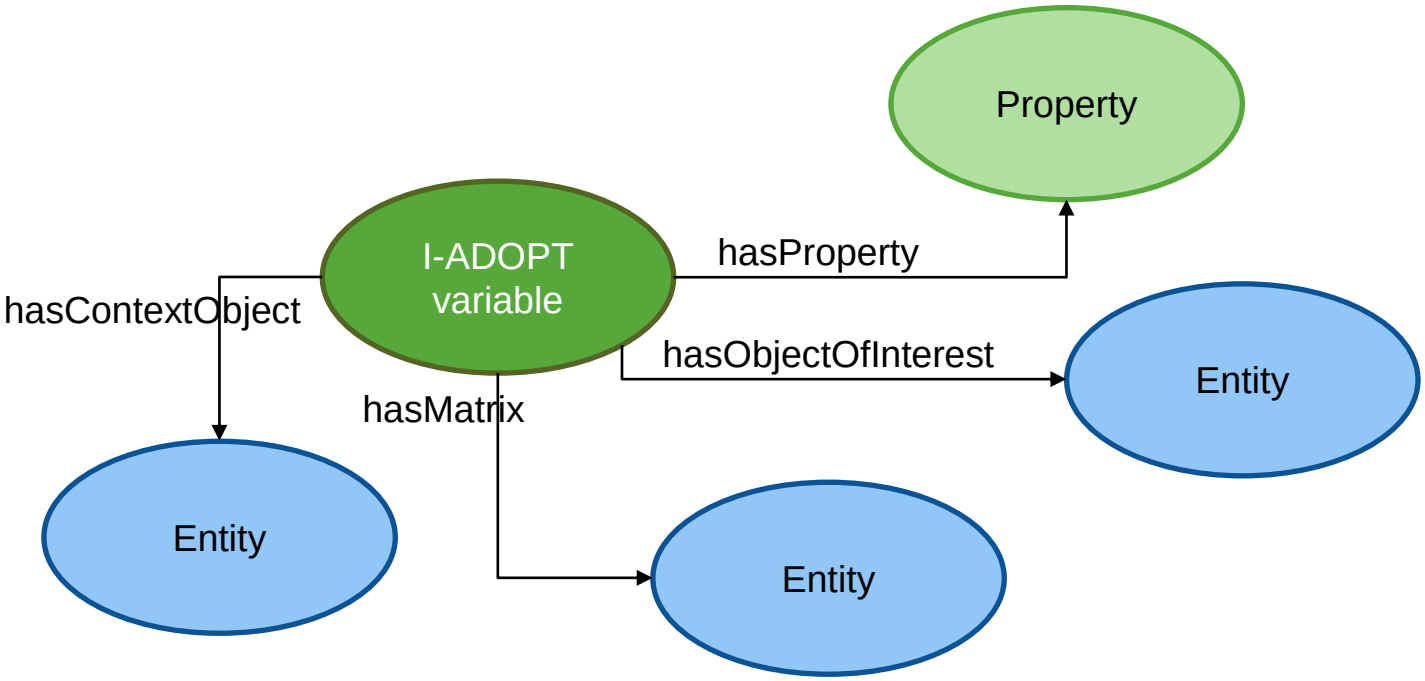
https://w3id.org/iadopt



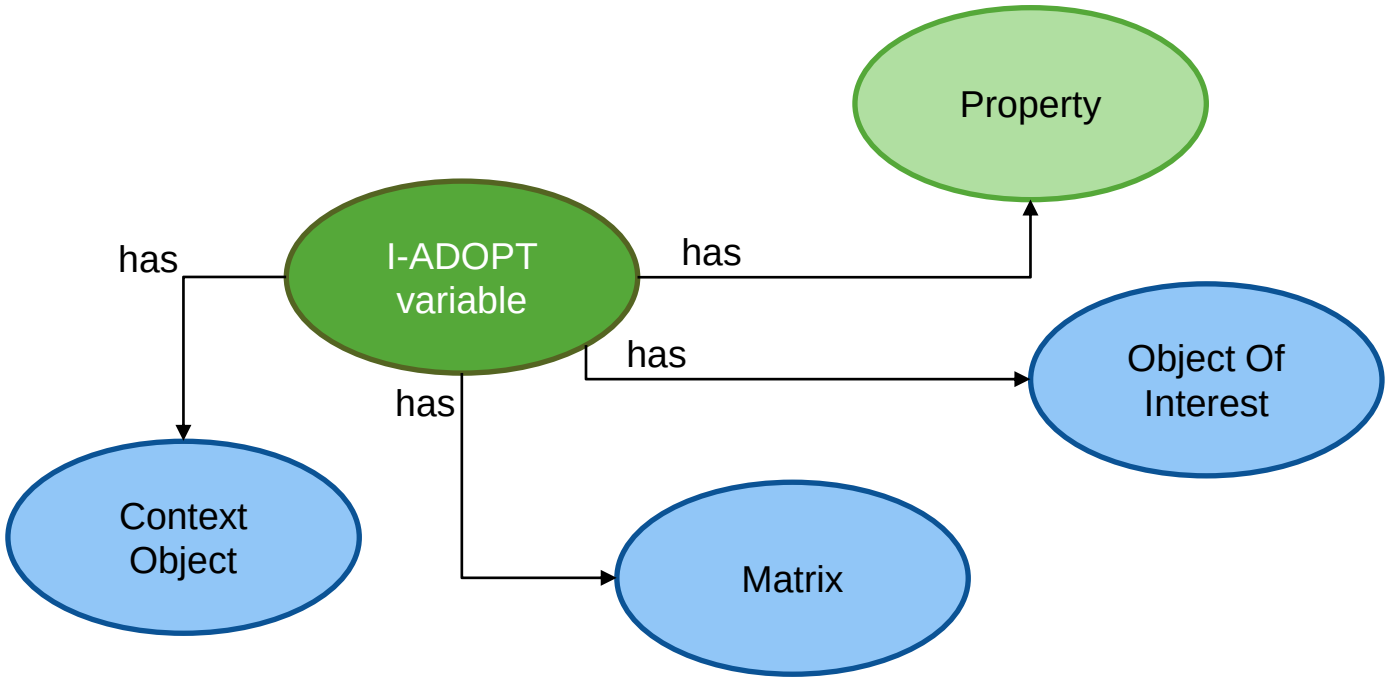

- https://github.com/i-adopt
- DOI: 10.15497/RDA00071

RESEARCH DATA ALLIANCE
I-ADOPT WG

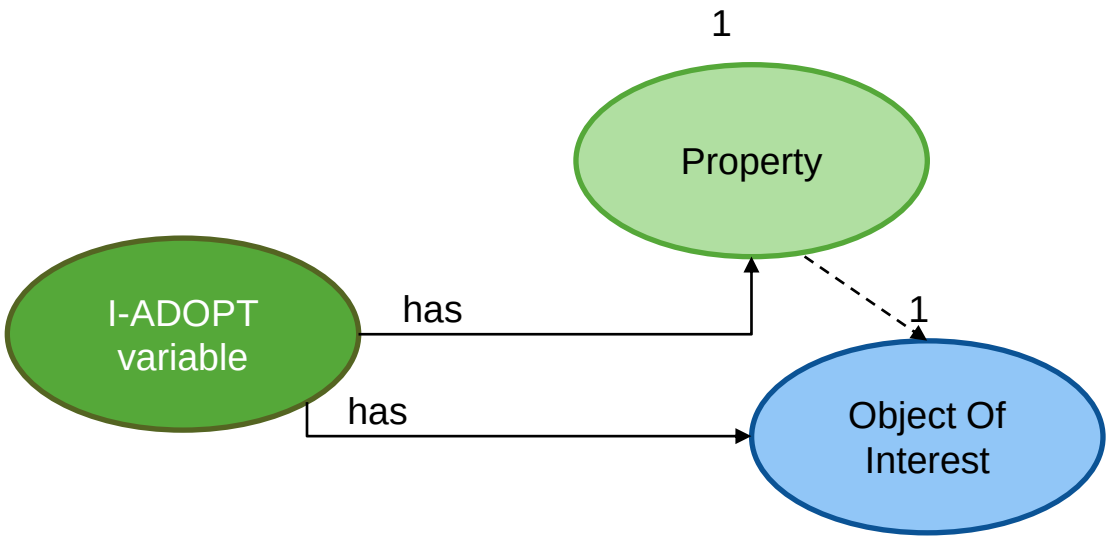
# I-ADOPT ontology explained



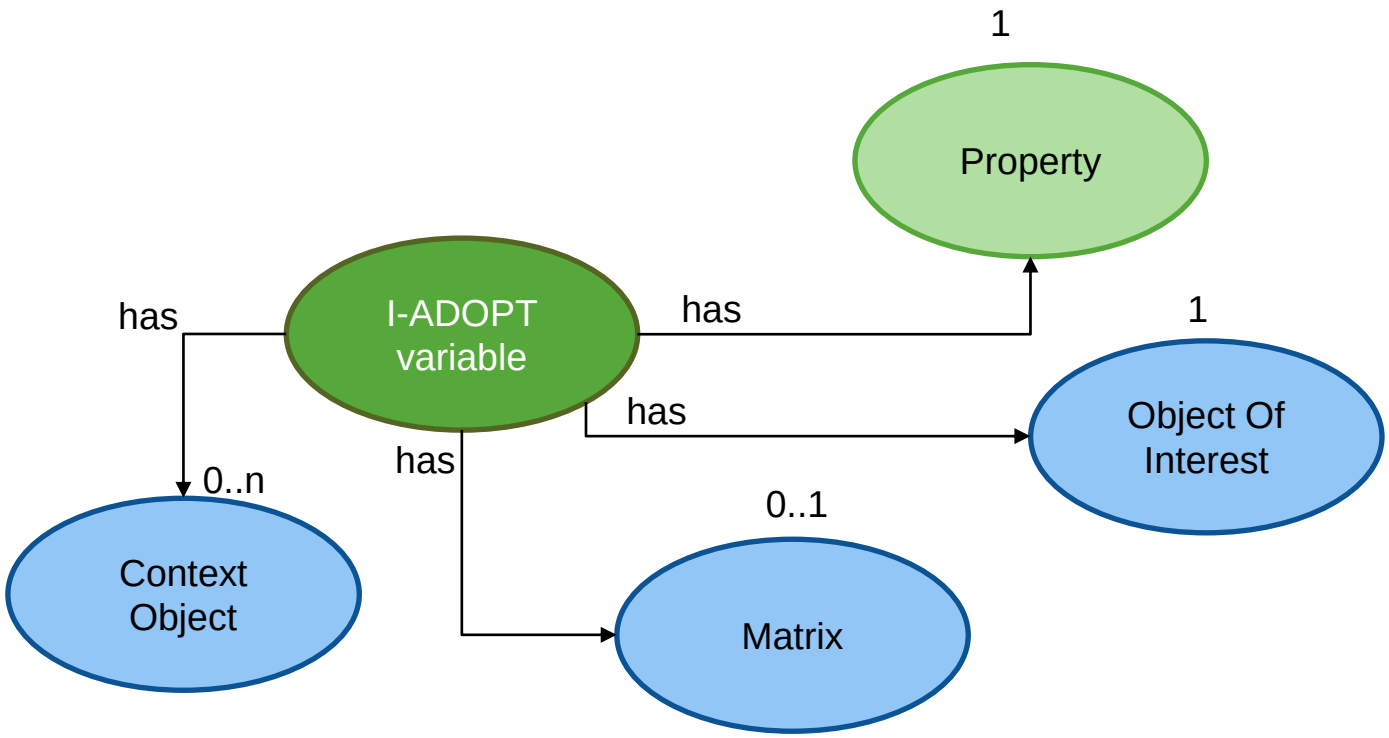
# I-ADOPT ontology simplified explanation



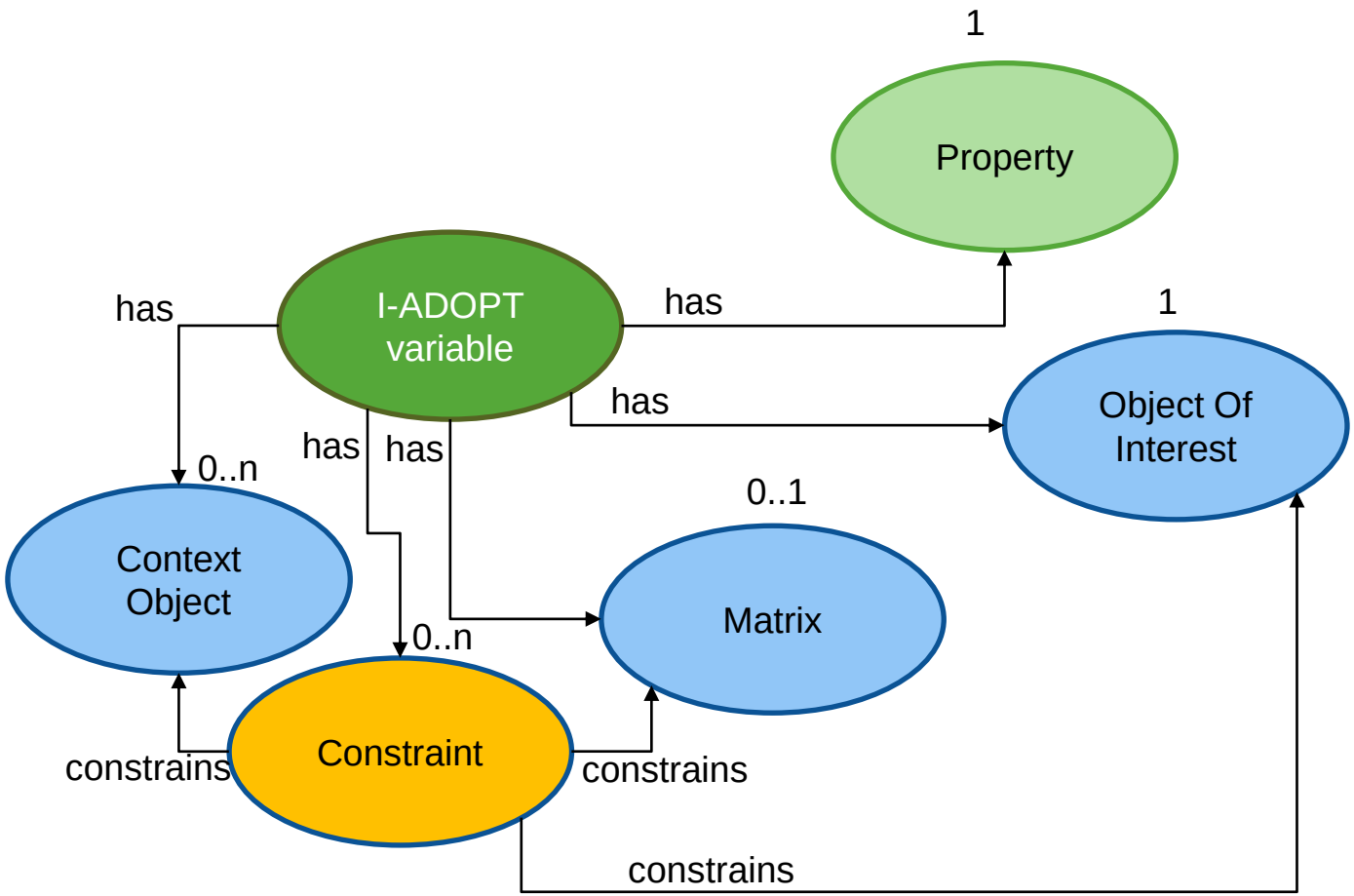
# I-ADOPT ontology simplified explanation – minimal description



# I-ADOPT ontology simplified explanation – extended description



# I-ADOPT (simplified) in an OWL ontology



# RDA I-ADOPT recommendations (DOI: 10.15497/RDA00071)

1. *Descriptions should be human and machine-readable*

Data creators and data curators or data publishers should describe the variable(s) of their datasets in a human- and machine-readable format.

2. *Descriptions should be explicit and sufficient*

The variable description should contain sufficient information so that the data can be re-used with minimum reliance on free-text documentation.

3. *Use of semantic artefacts*

The description should use FAIR semantic artefacts (e.g., controlled vocabularies or ontological relationships) and be compatible with Linked Data.

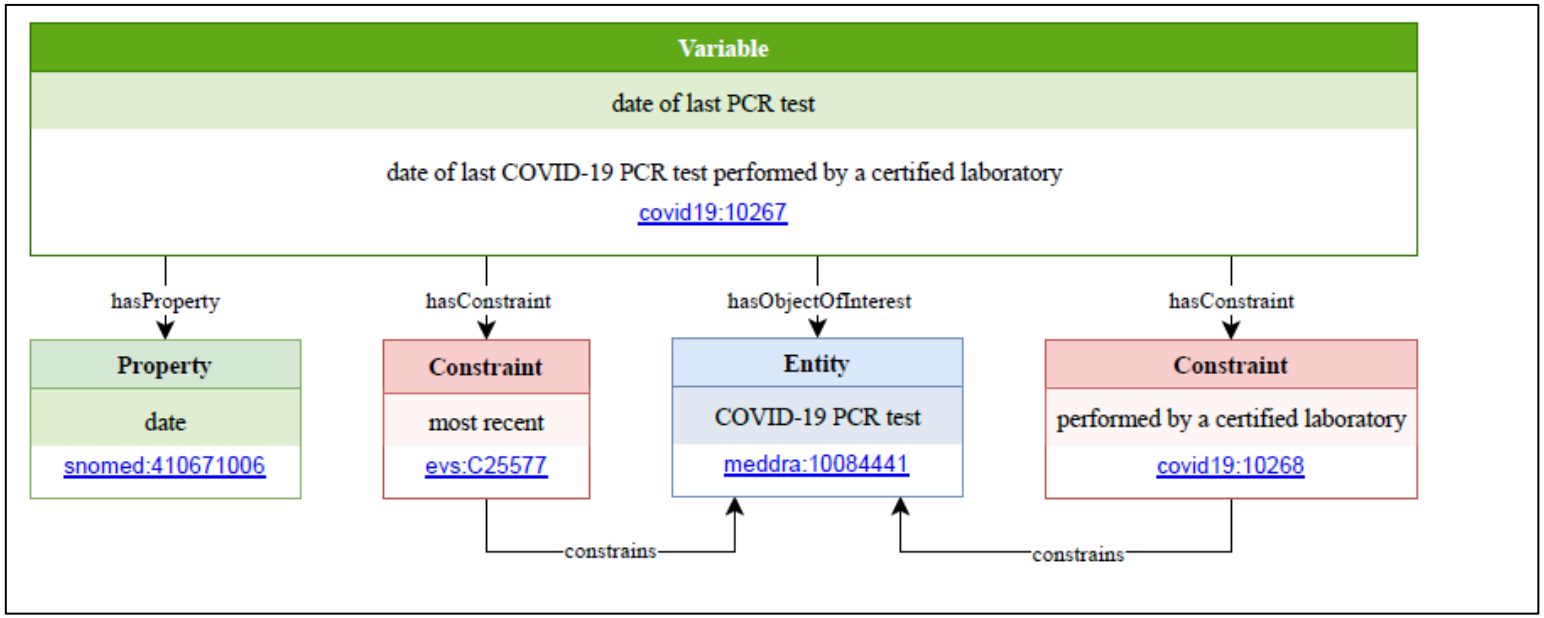
4. *Use of I-ADOPT ontology*

The description should follow a decomposition approach consistent with the classes and relations defined in the I-ADOPT ontology

5. *Reuse of I-ADOPT aligned terminology*

Reuse existing FAIR terminologies that are aligned with the I-ADOPT Framework. If no such terminology is available, you may either extend the existing variable description or create a new variable following the I-ADOPT framework.

# I-ADOPT example: Date of last PCR Test



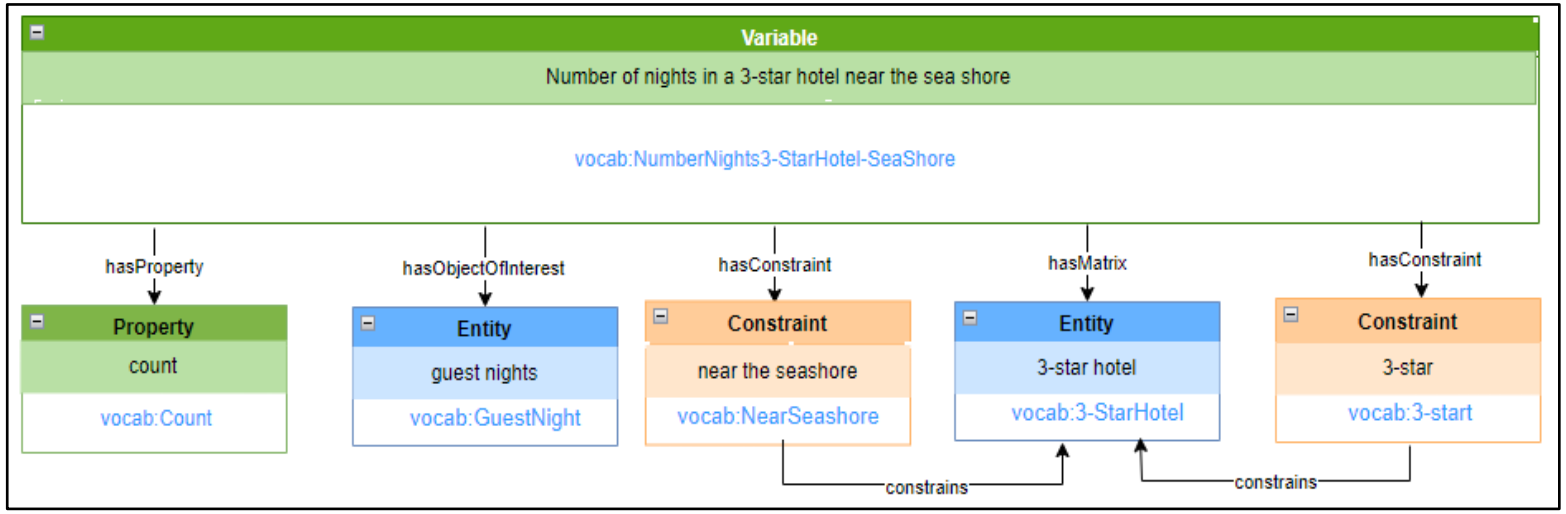

**Object of interest**: *COVID-19 PCR test*

**Property**: *date*

**Constraint**: *most recent* (constrains *COVID-10 PRC test*)

**Constraint**: *performed by a certified laboratory* (constrains *COVID-10 PRC test*)

# I-ADOPT example:
# Number of nights in a 3-star hotel near the seashore




**Object of interest**: *guest nights*

**Property**: *count*

**Matrix**: *hotel*

**Constraint**: *3-star* (constrains *hotel*)

**Constraint**: *near the seashore* (constrains *hotel*)

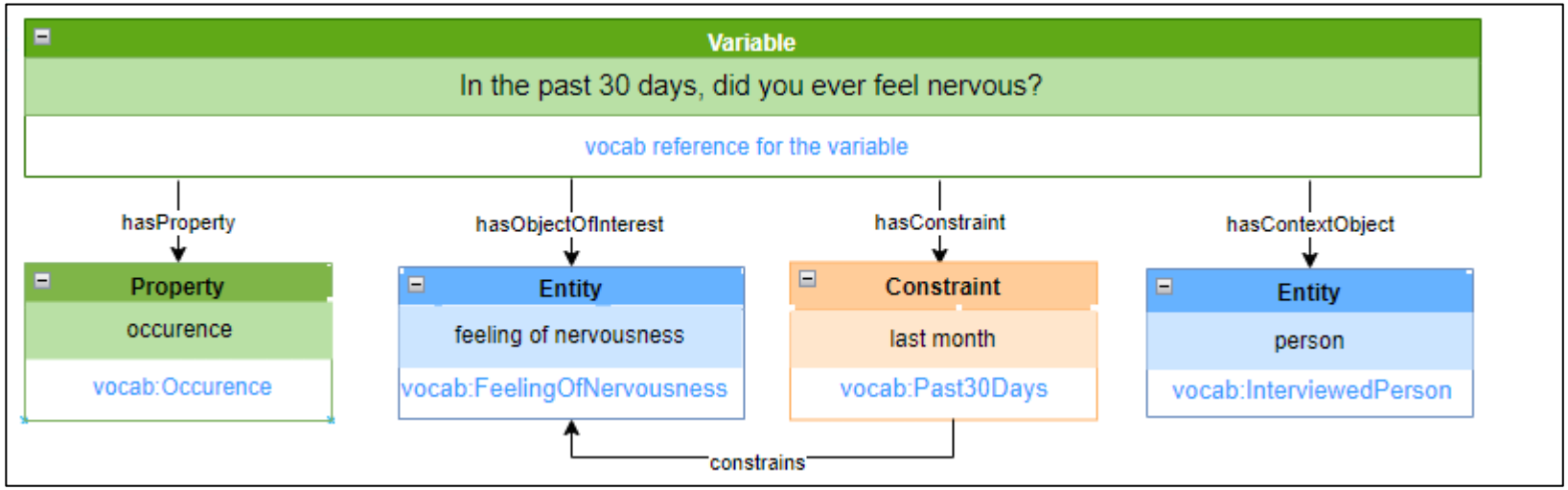
# Disambiguate variable descriptions using I-ADOPT
# 3 questions about feeling nervous

Consider these three questions:

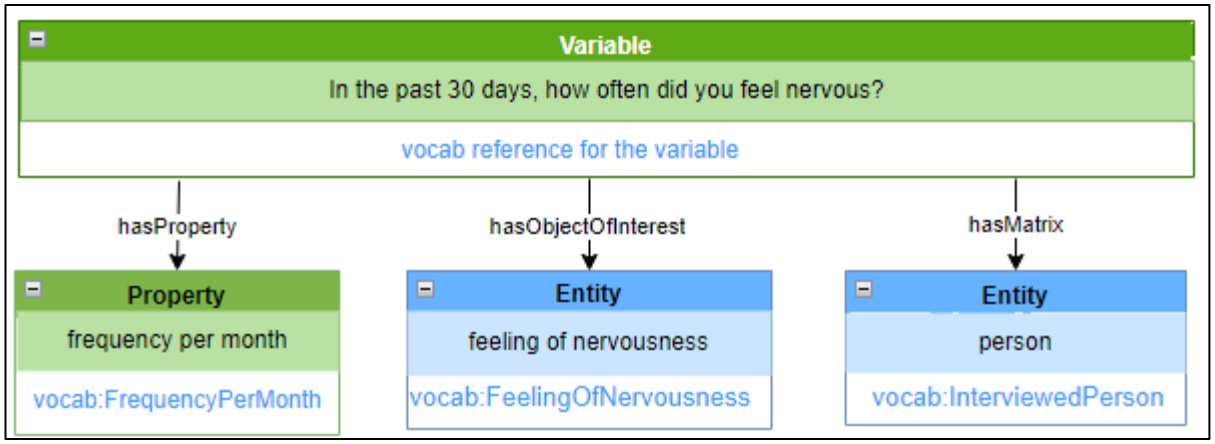
Q1: In the past 30 days, did you ever feel nervous?

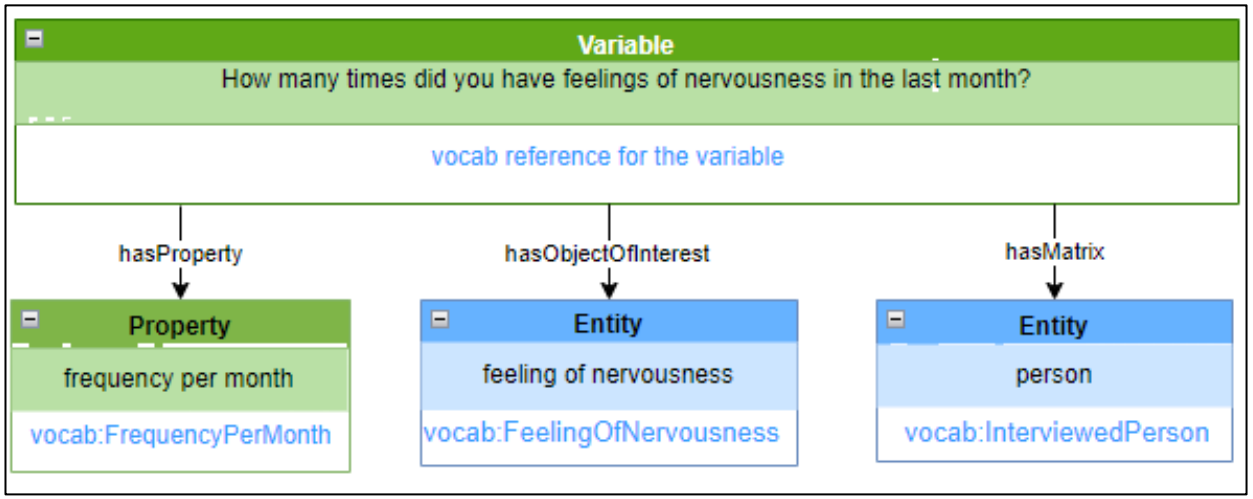
Q2: In the past 30 days, how often did you feel nervous?

Q3: How many times did you have feelings of nervousness in the last month?



# Disambiguate variable descriptions using I-ADOPT
# 3 questions about feeling nervous



# Outlook: Developing I-ADOPT services for reuse by researchers

- Based on:
  - User input (free text description) and specify FSRs (vocabularies) chosen by the research community
  - Named Entity Recognition (NER) and/or
  - Large Language Models (LLM)

  both require large sets of pre-modelled I-ADOPT variables (training set)

  Results into:
  - Decomposition in atomic parts based on NER
  - Arrangement of parts in I-ADOPT roles based on Variable Design Patterns