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ASAM OpenX Ontology

What is an ontology

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Ontology definition

An ontology provides standardized definitions for the concepts of a specific domain and their attributes, and defines typed relationships between the actual objects that belong to a concept.

Ontologies thus provide explicit knowledge models for domains that can help overcome the problem of data ambiguity.

They enable both humans and machines to understand the semantics of data in a common way and thus enable efficient communication and information exchange between different systems.

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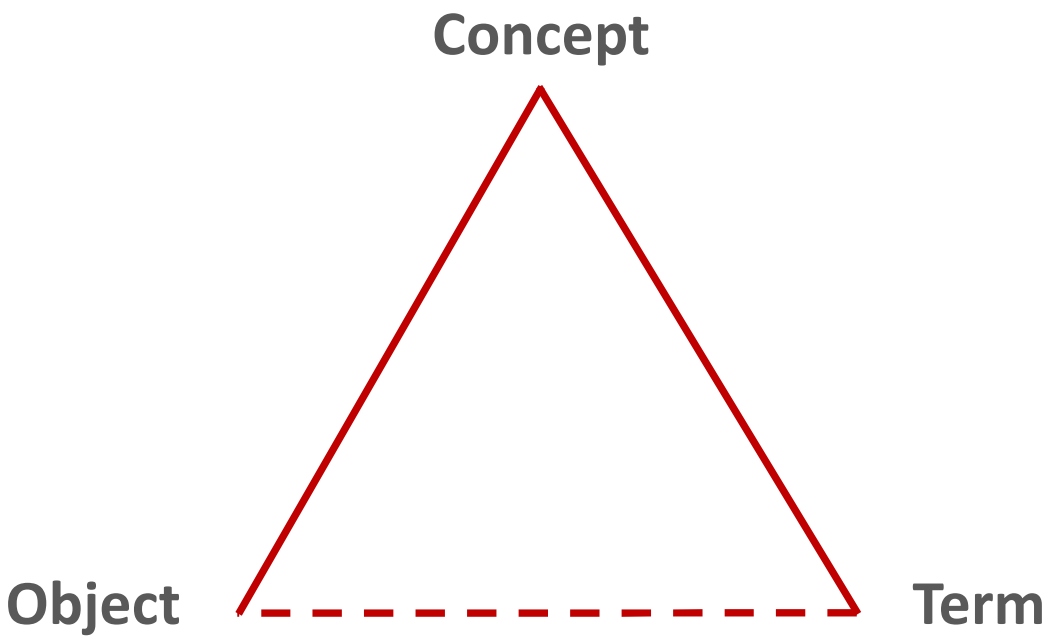
Concepts in a domain



Concepts in a domain: Scooter

… type of motorcycle with a step-through frame and a platform for the rider's feet.

… a human-powered street vehicle with a handlebar, deck, and wheels propelled by a rider pushing off the ground.

… a German dance and trance group

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„scooter“

„motor scooter“

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Concepts in a domain

Concept: https://www.wikidata.org/wiki/Q193234

Object

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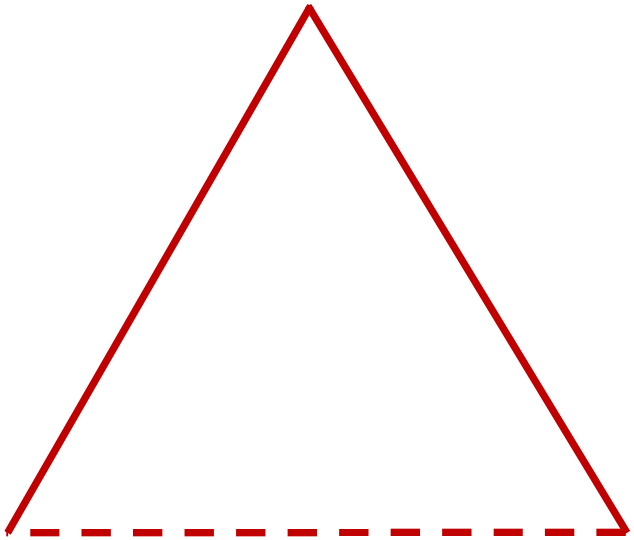

Term

De: Motorroller

En: Scooter (motorcycle)

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Properties and relations

https://www.wikidata.org/wiki/Q193234

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invented in

https://www.wikidata.org/wiki/Q38

drives on

https://www.wikidata.org/wiki/Q34442

Properties

- 2 wheels
- Step-through frame
- Platform for feet
- Engine
- Seat

Relations to other concepts

- Sovereign state, https://www.wikidata.org/wiki/Q3624078
- Road https://www.wikidata.org/wiki/Q34442

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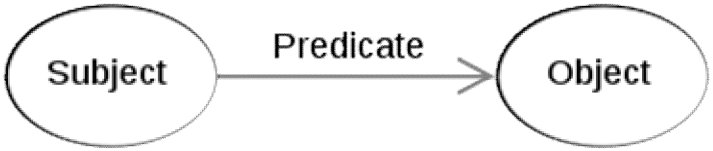
Triples

Relations between objects create triples



invented in

https://www.wikidata.org/wiki/Q193234

https://www.wikidata.org/wiki/Q38

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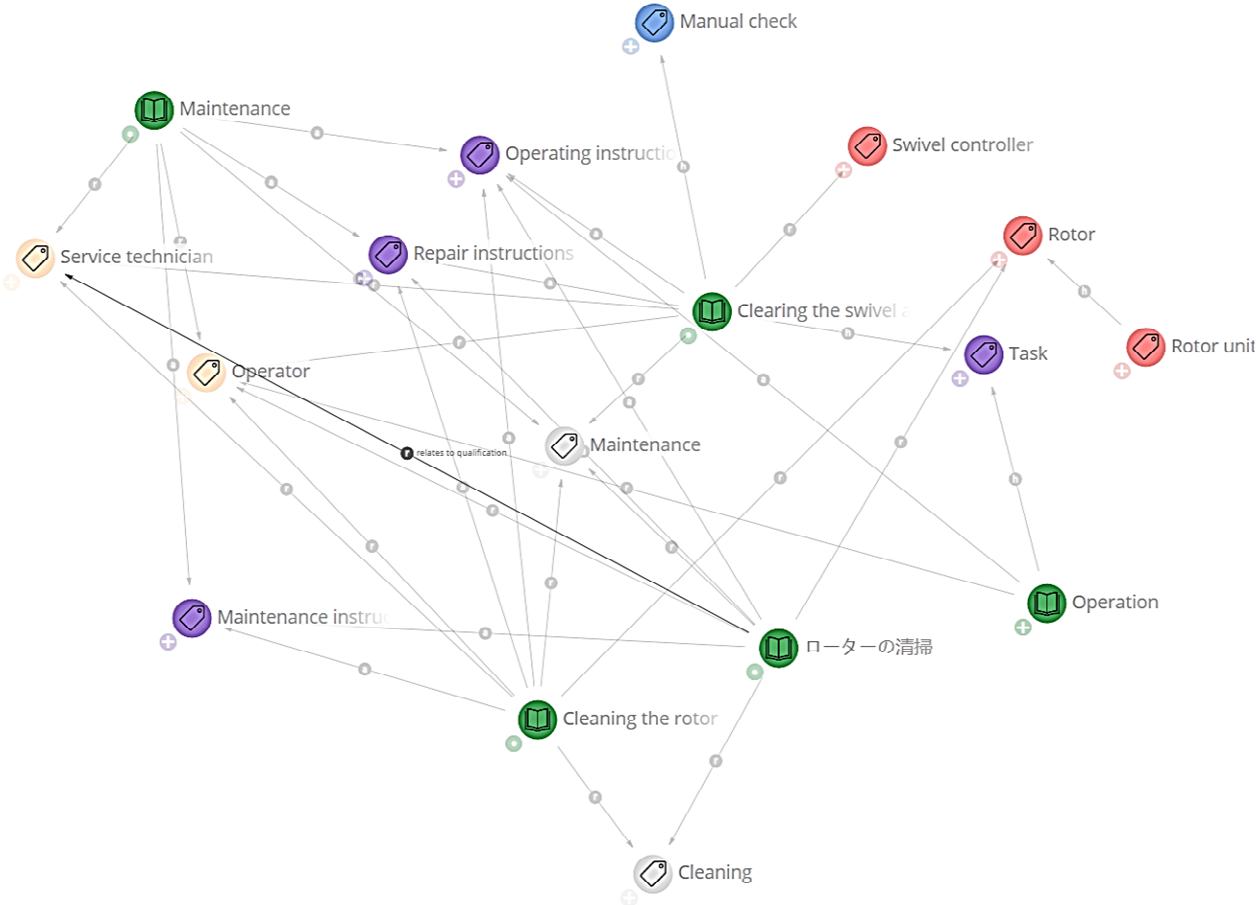
Semantic network

Triples create a semantic network of information that is machine readable



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Benefits of ontologies

- Provide an explicit and unambiguous representation of the concepts and relations that are important in a domain of interest to a community of people.
- Provide a framework for a simplified and controlled language that can be used by members of the community to make statements and questions in the context of the domain
- Provide background knowledge of the domain in a form that a computer can use to understand statements that are made by members of the community using the controlled language.

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Benefits of ontologies

- Provides basic axioms for:
  - Calculating semantic proximity: descriptions that mean the same thing even through they do not say the same thing
  - Use for classification, finding similar scenarios, etc.
  - Logic and rule-based reasoning to infer relationships implied in the expressions
    - Use for finding errors, assessing coverage, extracting common patterns
- Language-independent
- Basis for information/data exchange between systems and applications

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Ontologies = future

- 75% of the Fortune 500 companies have some kind of smart data or semantics program underway
  - 360° initiatives
  - comprehensive enterprise data systems
  - machine learning/data science projects
- Governments have all moved critical data resources into semantic form
- Gartner predicts that the application of graph processing and graph databases will grow at 100% annually over the next few years to accelerate data preparation and enable more complex and adaptive data science. (https://www.gartner.com/smarterwithgartner/gartner-top-10-data-analytics-trends/)

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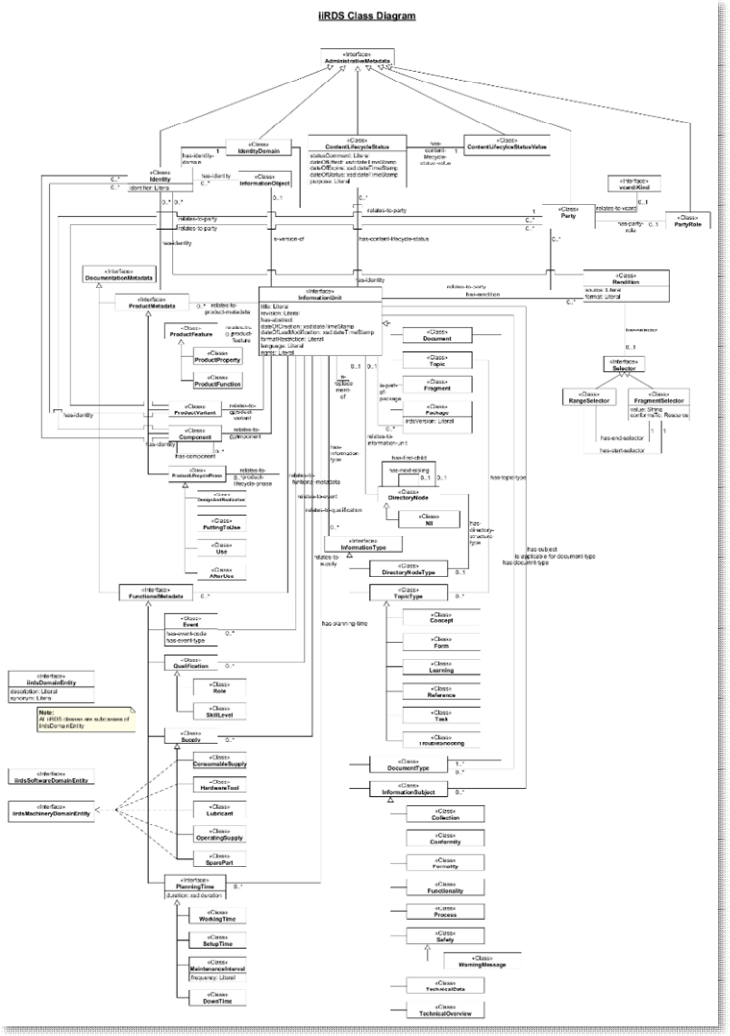
Example: iiRDS

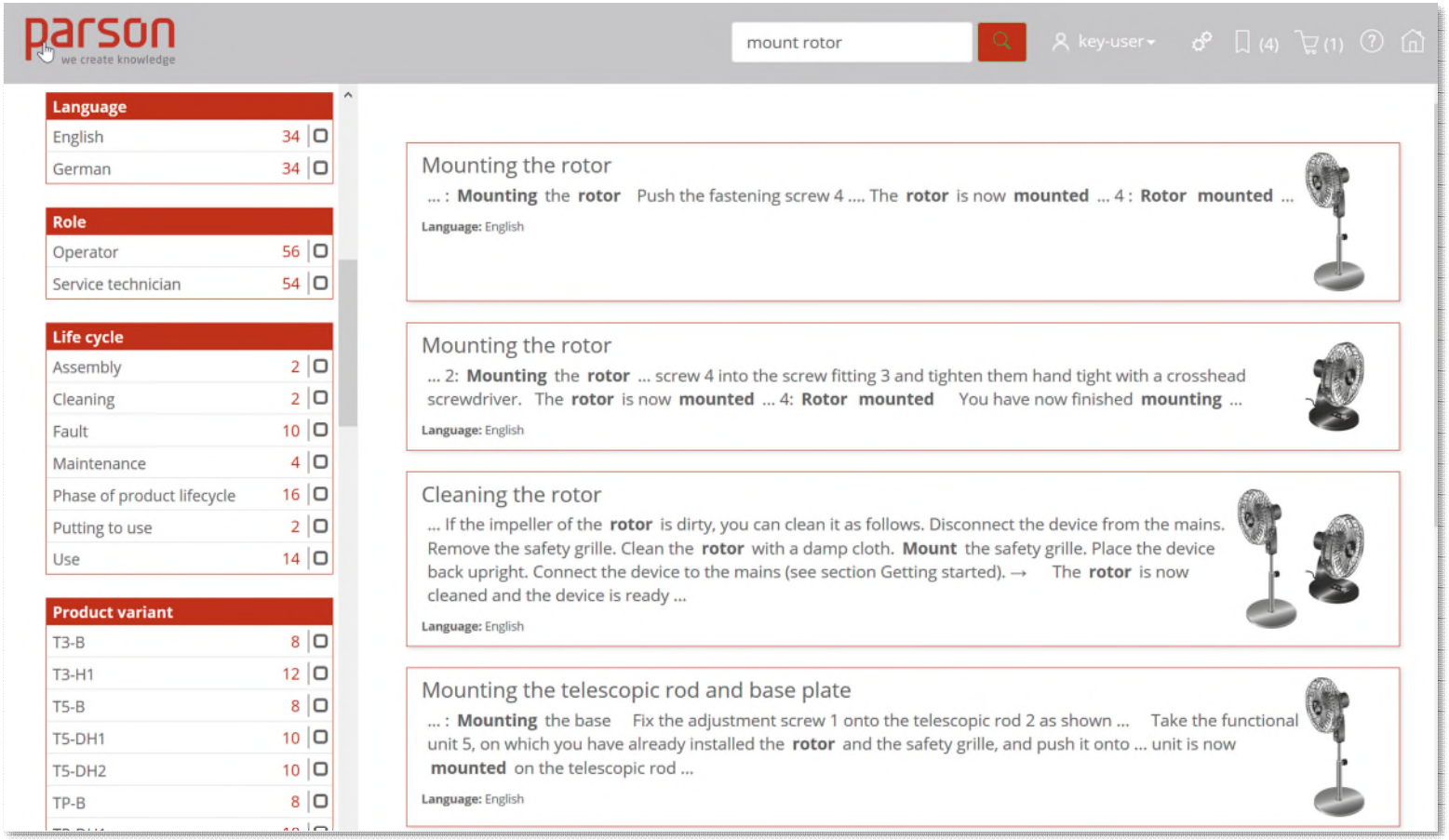


iiRDS – intelligent information/documentation for the connected industry

- Information types
- Information subjects
- Product lifecycle phases
- Content lifecycle phases
- Qualification
- Skills
- Roles
- …

https://iirds.org/

Example iiRDS: Semantic search



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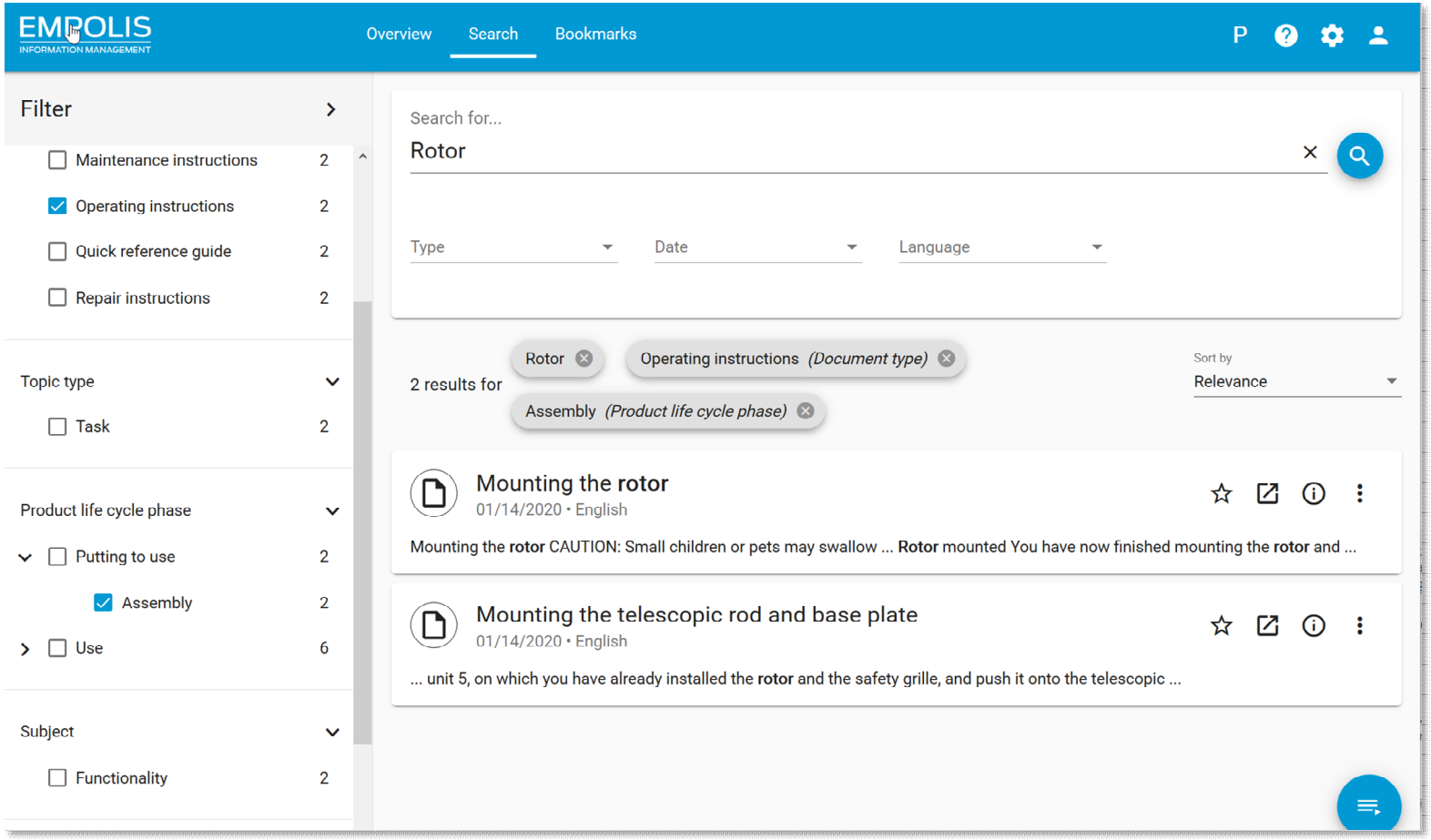
Example iiRDS: Semantic search

Another content delivery portal, same functionality thanks to iiRDS being a standard



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ASAM OpenX Ontology

How to write good user stories

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Good user stories

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What is a user story

- Describes requirements for a software, a solution, a system
- Written from the user‘s perspective
- Explains reason for feature requirement
- Basis for communication and further specification

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Good user stories

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Format

- As a <user role>
- I want to <do>, <have>, <use> something
- because / in order to

As an *AV/ADAS developer* company, I want to *search, review and reuse scenarios* built by other companies, because we *rely on spezialized external suppliers* for scenario data for our development activities.

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Dos and Don'ts

- Do not specify the implementation or technical solution, just the requirement of the user

  
  As an ADAS developer, I want to integrate external scenario data as Java library

  
  As an ADAS developer, I want to integrate external scenario data directly in my programming environment to avoid switching tools during work.

- Do not forget the reason/motivation.
- Do not make the user story too large, e.g. by putting two requirements into one.

  
  As an ADAS developer, I want to integrate external scenario in my programming environment and immediately recognize it as external, so I am aware that this data can be overwritten at next import.

  
  As an ADAS developer, I want to use scenario data.

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INVEST criteria

A user story needs to fulfil these criteria:

Independent

Small

Valuable

Testable

Negotiable

Estimatable

we create knowledge

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