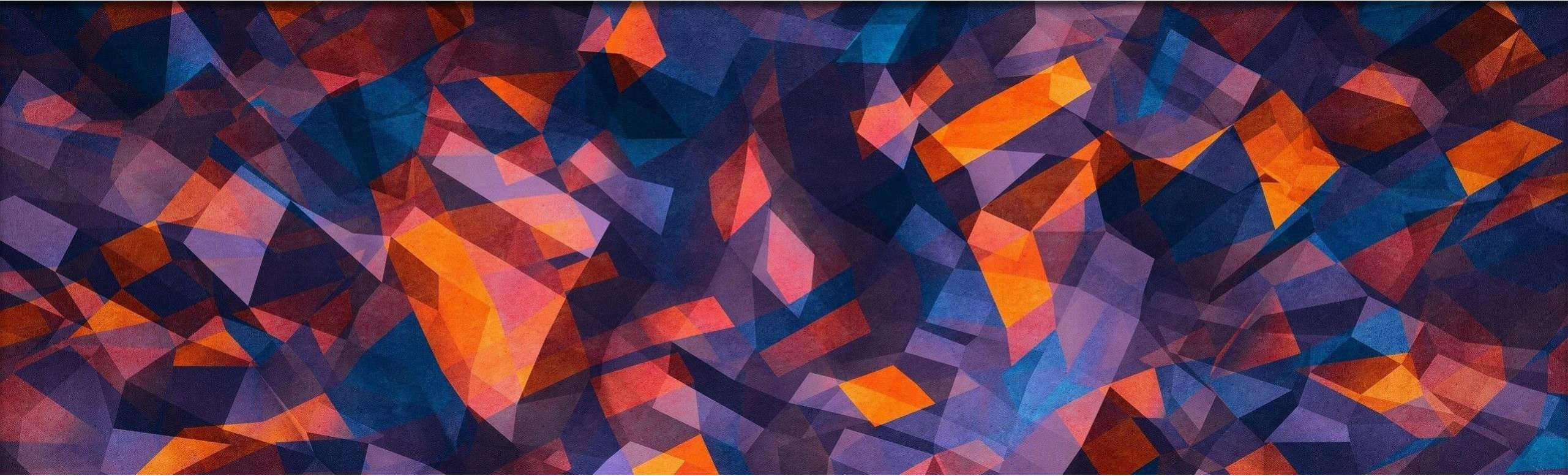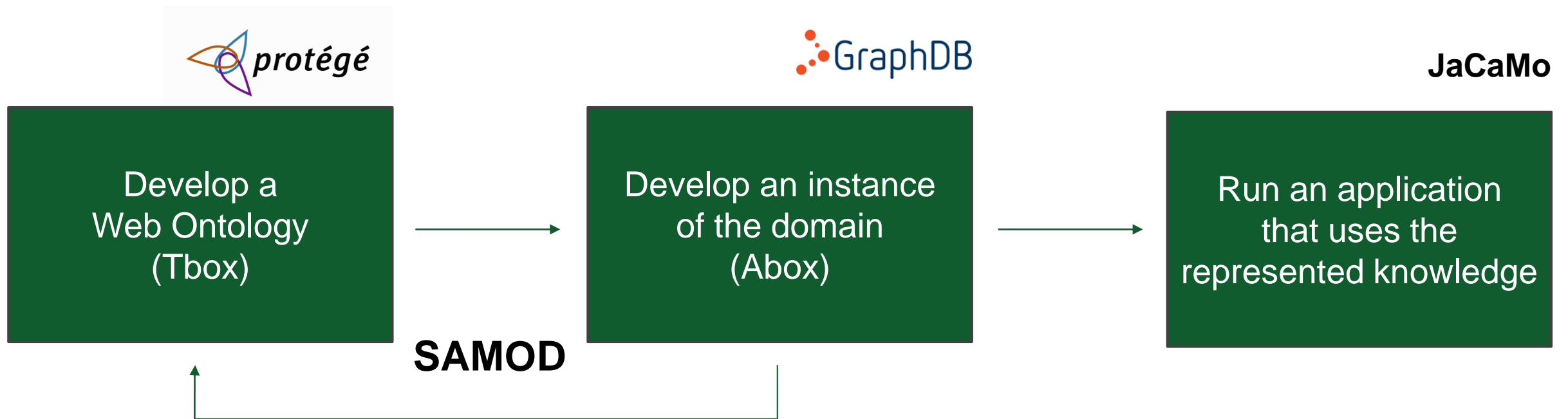Universität St.Gallen

Exercise 3: Web Ontologies and Knowledge Graphs

Web-based Autonomous Systems

Chair for Interaction- and Communication-based Systems (ICS-HSG)

Engineering Web Ontologies

Task 1: Design a First Web Ontology with **OWL** and **Protégé**

Task 2: Design an Ontology for Smart Farming using the **SAMOD Methodology**

Engineering Web Ontologies with SAMOD

The SAMOD methodology (simplified) includes ~~a sequence~~ of steps to define:

1. Motivating scenario

"A farm contains two tractors A and B…"

2. Competency Questions

Q1: What are the tractors contained in a farm?

3. Glossary of Terms

Farm: A plot of land devoted to the growing of crops.
Tractor: …
Contains: …

4. Tbox based on the glossary

was:Farm rdf:type owl:Class.
was:Tractor rdf:type owl:Class.

5. ABox based on the Scenario

ex:myFarm a was:Farm.
ex:tractorA a was:Tractor.
ex:tractorB a was:Tractor.
ex:myFarm hmas:contains ex:…
ex:myFarm hmas:contains ex:…

6. Formalization of Competency Q…

SELECT ?tractor WHERE {
   ?tractor a was:Tractor.
      ex:myFarm hmas:contains ?tractor.
}
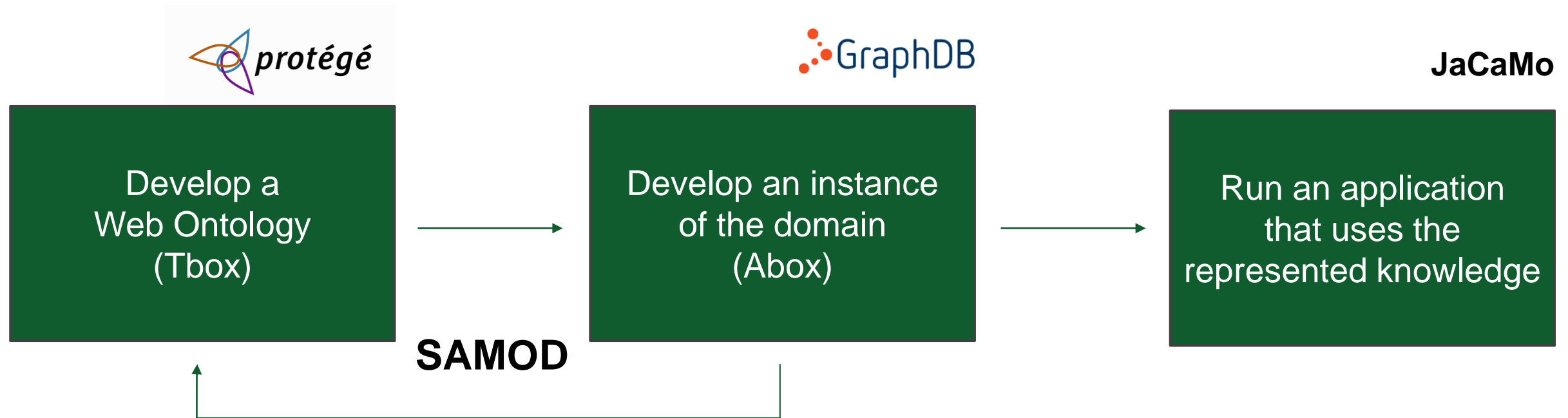
Informally define domain instance

Prepare informal tests

Informally define terms

Formally define terms

Formally define domain instance

Test with SPARQL

Engineering Web Ontologies with SAMOD

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protégé

GraphDB

JaCaMo

**Develop a
Web Ontology
(Tbox)**

**Develop an instance
of the domain
(Abox)**

**Run an application
that uses the
represented knowledge**

SAMOD

Task 1: Design a First Web Ontology with **OWL** and **Protégé**

Task 2: Design an Ontology for Smart Farming using the **SAMOD Methodology**
- **2.1:** Define the **Glossary of Terms** and the related **Tbox**
- **2.2:** Define the an **ABox** and the related **SPARQL queries**
- **2.3:** Enable autonomous agents to query your knowledge graph in a **JaCaMo application**