# Ω-RIDL

## Towards Ontological Commitments with Ω-RIDL Markup Language

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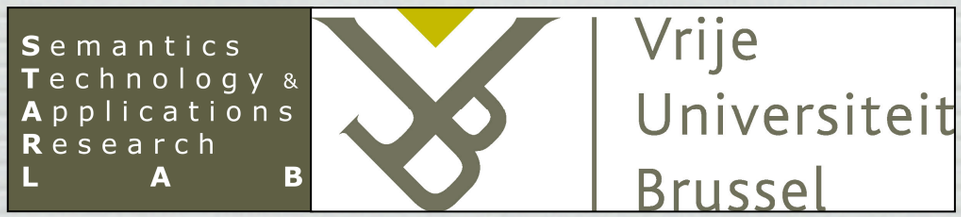


# Introduction

Ω-RIDL: A language for specifying ontological commitments and conceptual querying

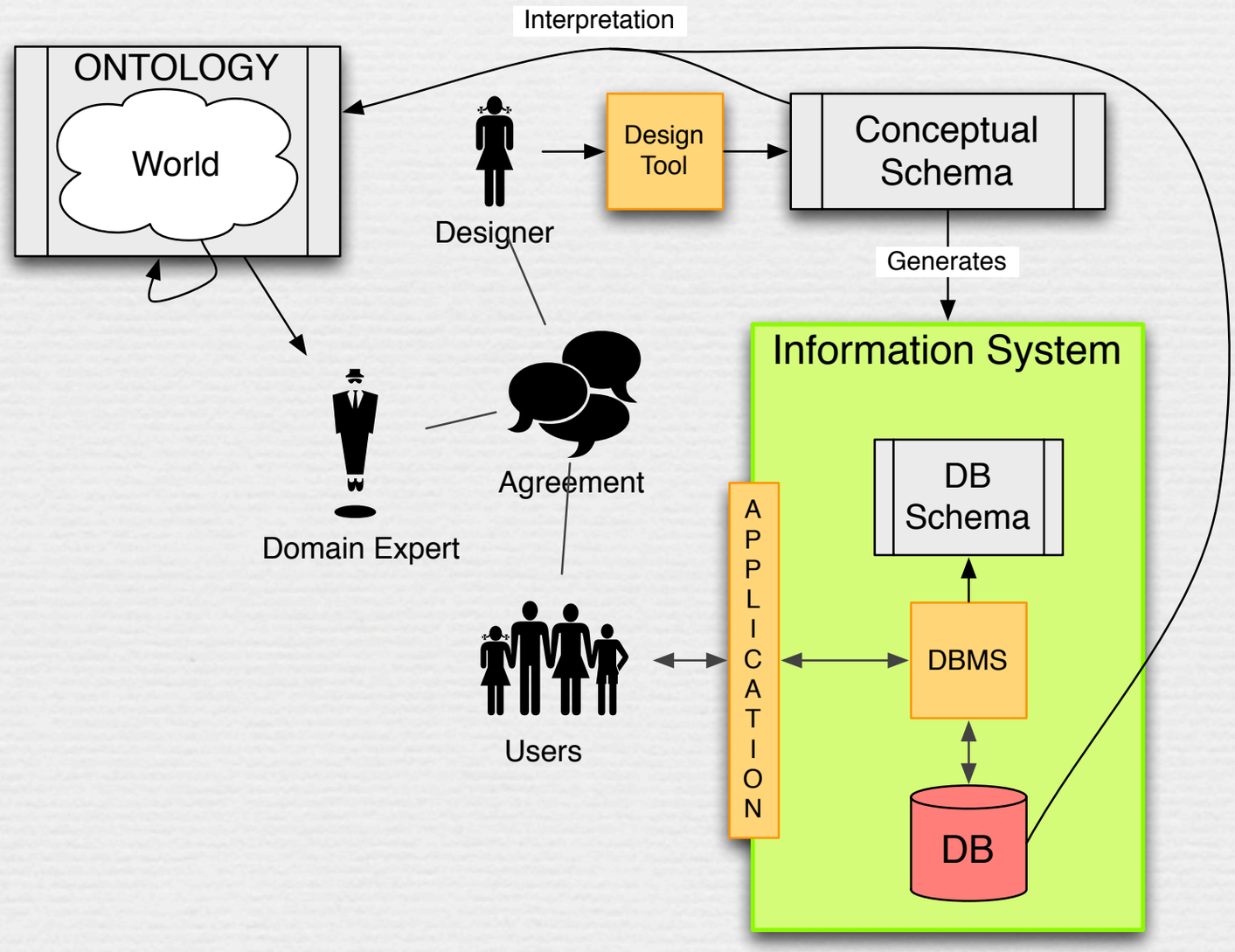
=> Semantically unlocks legacy systems

# Overview

- Ontologies and the DOGMA approach
- DOGMA Studio
- Wine auction site running example
- Summary
- Future Work

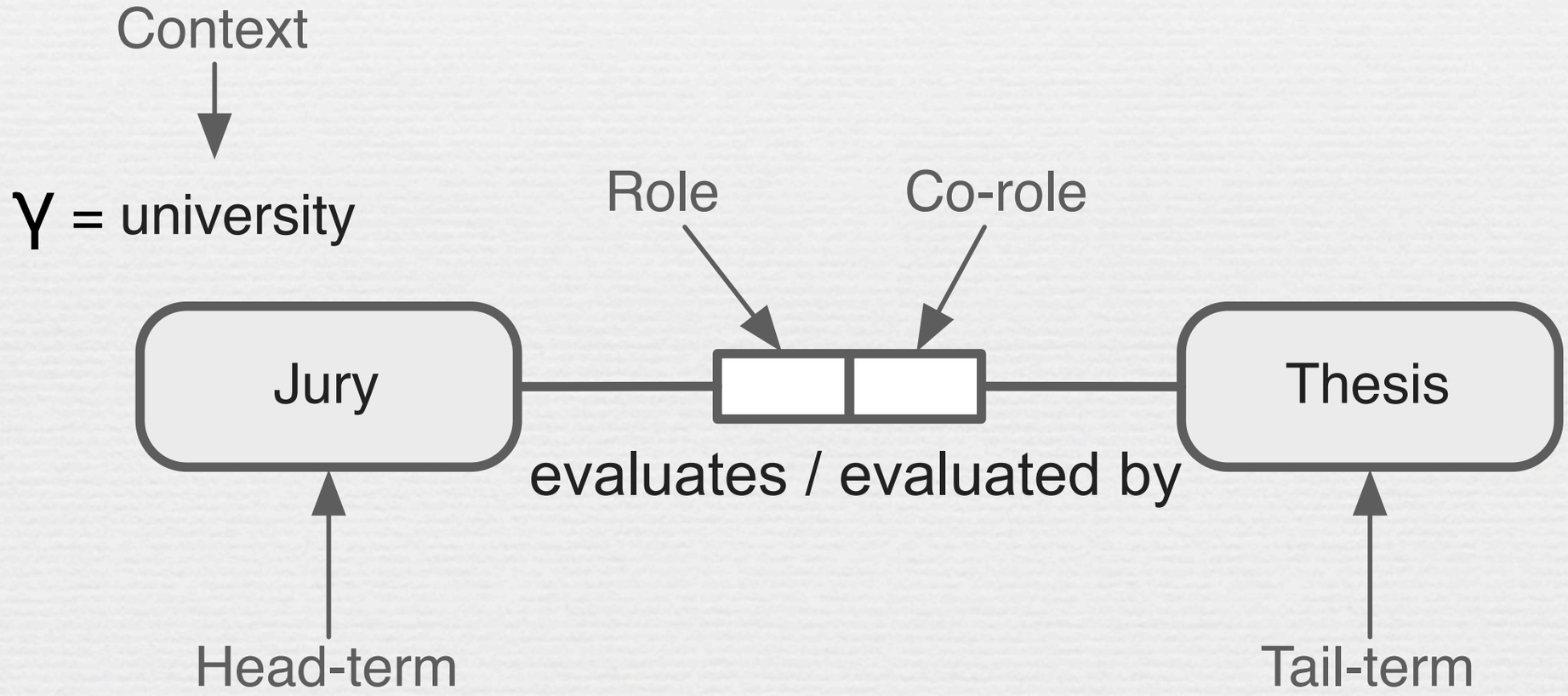
# Ontologies

An ontology is an "explicit specification of a shared conceptualization of a certain domain" – T. Gruber



# DOGMA

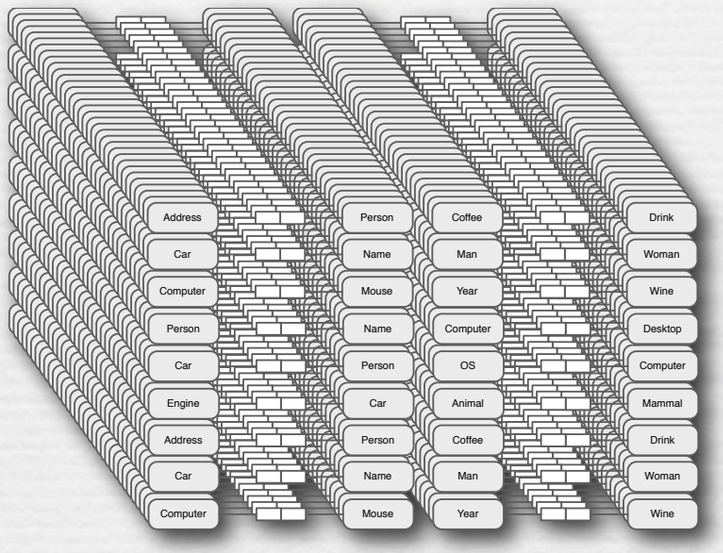
## Developing Ontology Grounded Methods and Applications



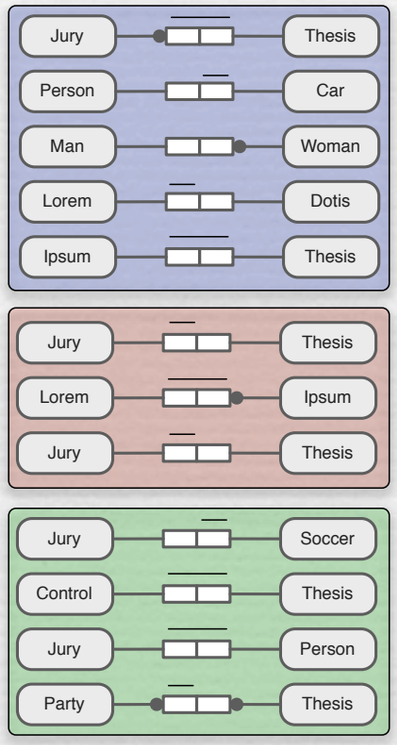

Lexon: the elementary building block

# DOGMA Layers

## Lexon Base




## Commitment Layer




## Applications


*"Double articulation principle"*

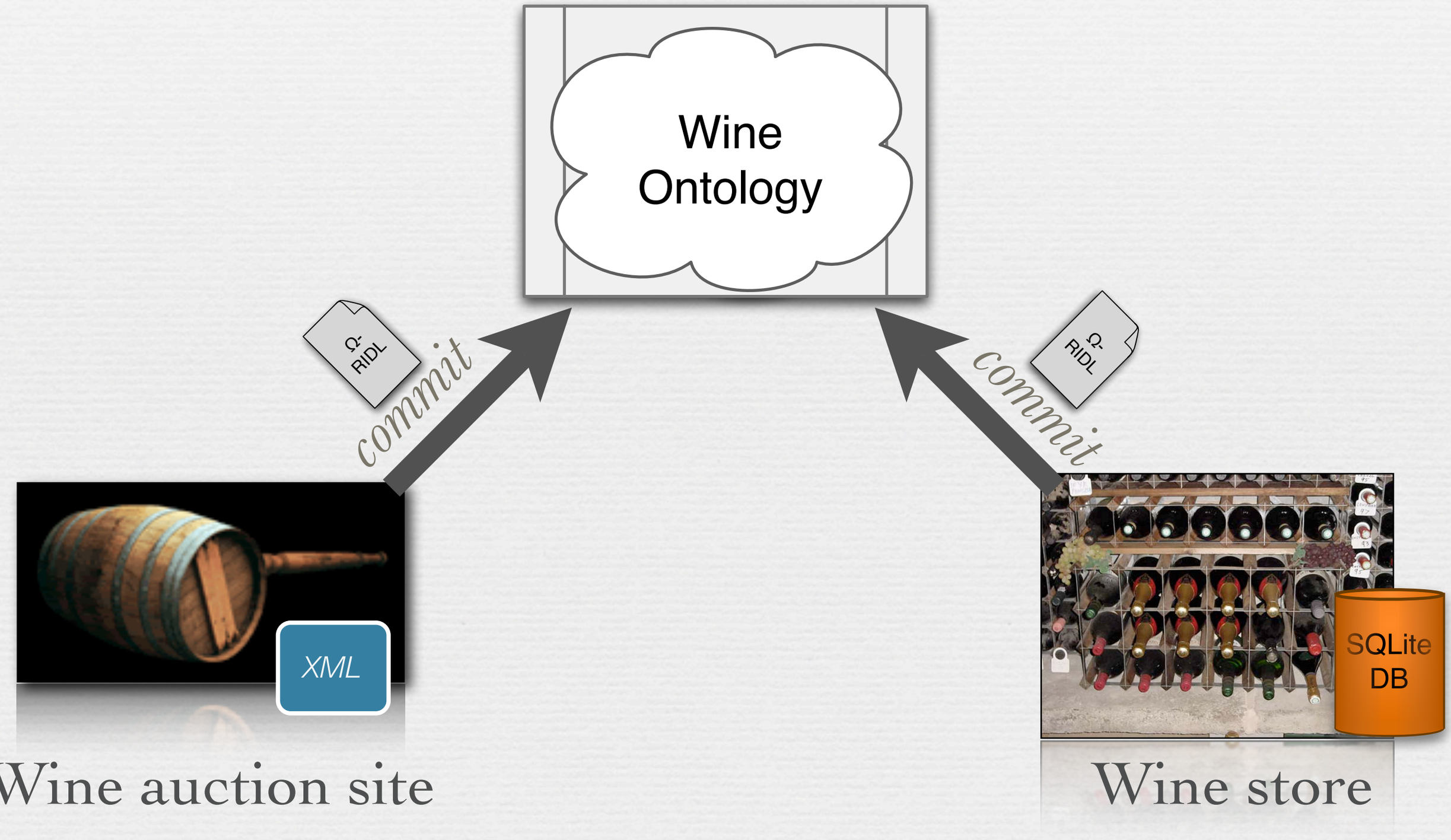
# Ontological Commitment

- Selection of lexons
- Axiomatization by applying semantic rules
- Interpretation through mapping of application symbols

# DOGMA Studio

- Browses the Lexon base with NORM tree visualization based on ORM
- Create commitments with T-Lex tool
  - Drag ‘n Drop selection of lexons
  - Graphical constraints and textual in Ω-RIDL
  - Exports Ω-RIDL ML

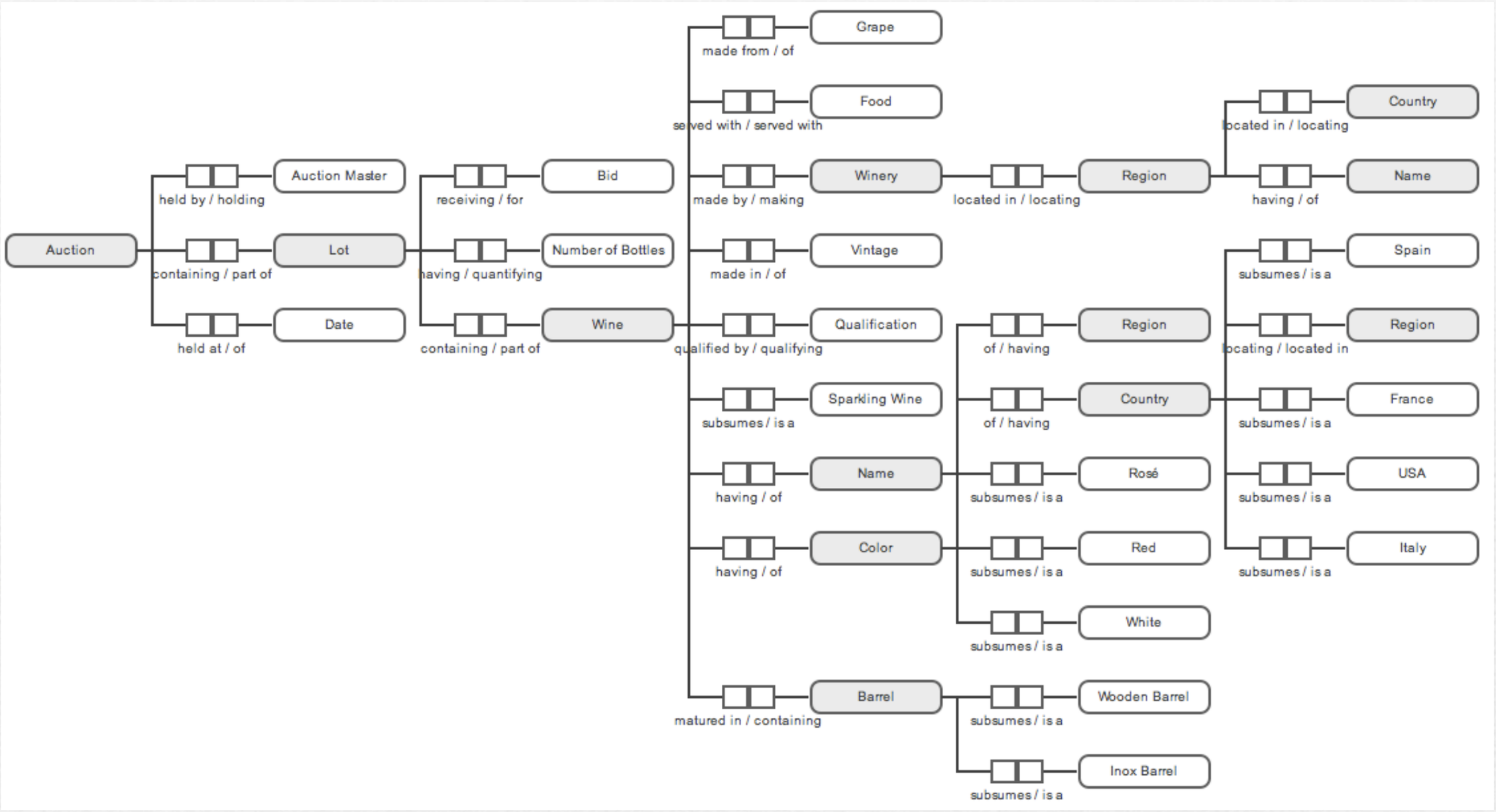
# Running Example



# XML Sample

```
<auction auction-date="2007-03-18">
        <lot lot-nr="1">
                <estimation>
                        <low-price>280</low-price> <high-price>400</high-price>
                </estimation>
                <wine>
                        <name>d'Yquem</name>
                        <vintage>1999</vintage>
                        <region>Sauternes</region>
                        <country>France</country>
                        <classification>1er Grand Cru Classé</classification>
                        <quantity>12</quantity>
                        <comment>OWC</comment>
                </wine>
        </lot>
        <lot lot-nr="2">
                <estimation>
                        <low-price>200</low-price> <high-price>280</high-price>
                </estimation>
                <wine>
                        <name>Beauséjour Bécot</name>
                        <vintage>1994</vintage>
                        <region>St Emilion</region>
                        <country>France</country>
                        <classification>1er Grand Cru Classé</classification>
                        <quantity>12</quantity>
                        <comment>Neck or better, OWC</comment>
                </wine>
        </lot>
</auction>
```

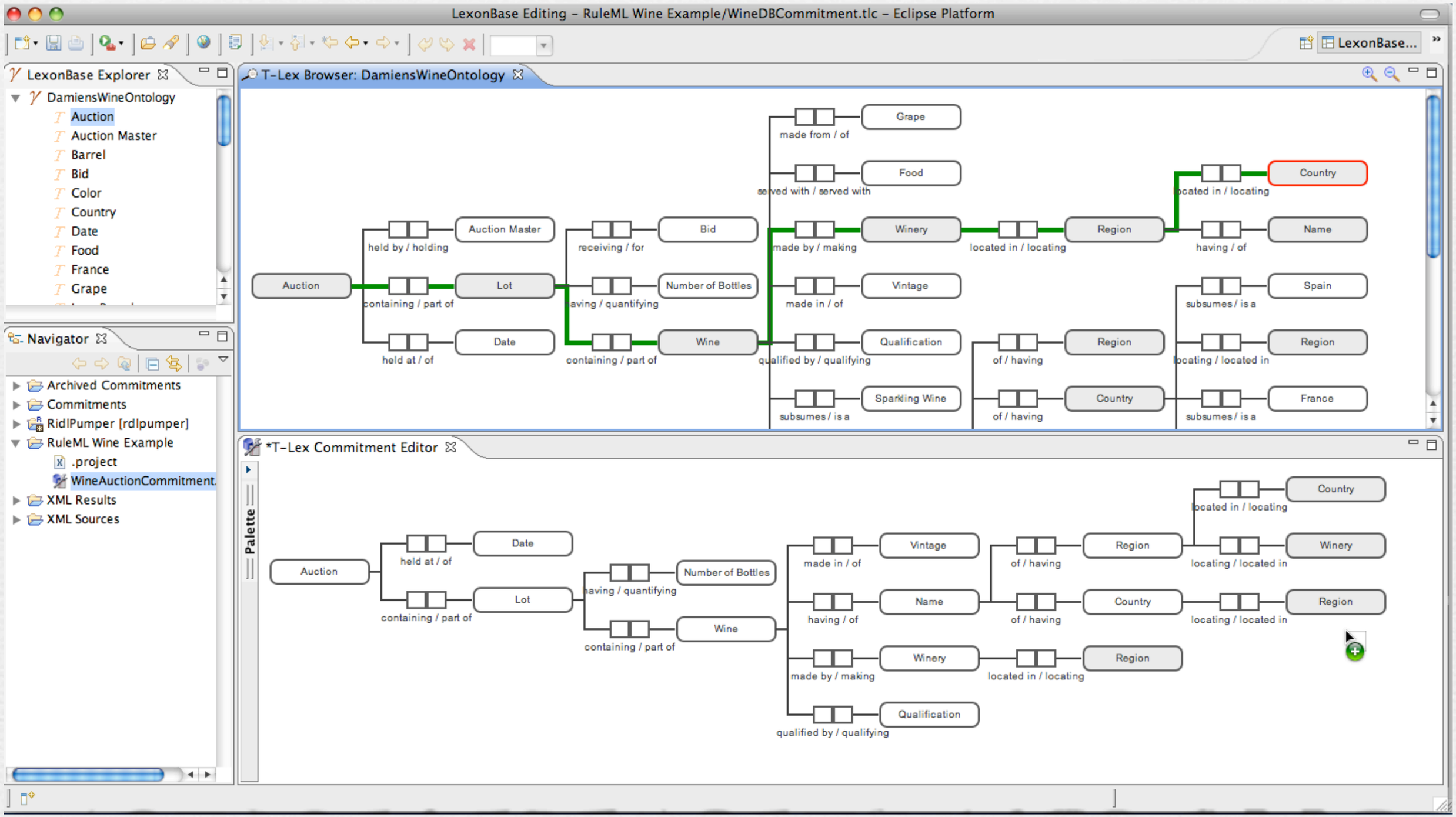
# Wine Auction Conceptualization




Mined from different sources: domain experts, wikipedia, texts, ...

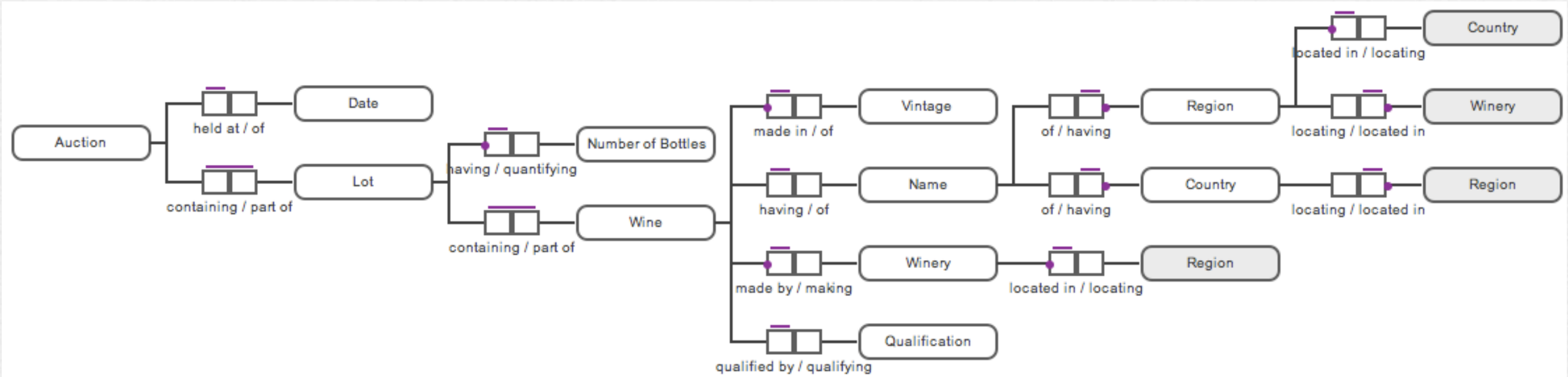
# Auction Commitment

## 1. Selection



# Auction Commitment

## 2. Axiomatization



# Uniqueness Constraint (1)

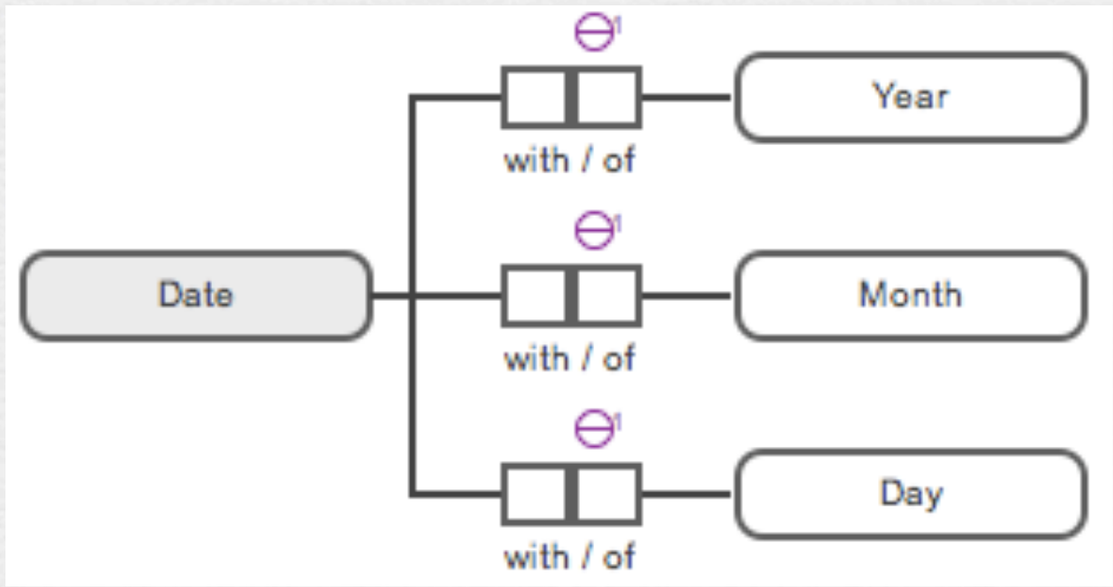
each Wine is made by at most 1 Winery

```
<occurrenceConstraint comparator="lessThanOrEqual" number="1">
  <setExpression>
    <lexonBasePath>
      <context>Wine Auctions</context>
      <headTerm>Wine</headTerm>
      <role>made by</role>
      <coRole>making</coRole>
      <tailTerm>Winery</tailTerm>
    </lexonBasePath>
  </setExpression>
</occurrenceConstraint>
```

# Uniqueness Constraint (2)

each Date is identified by
(Year of Date and Month of Date and Day of Date)

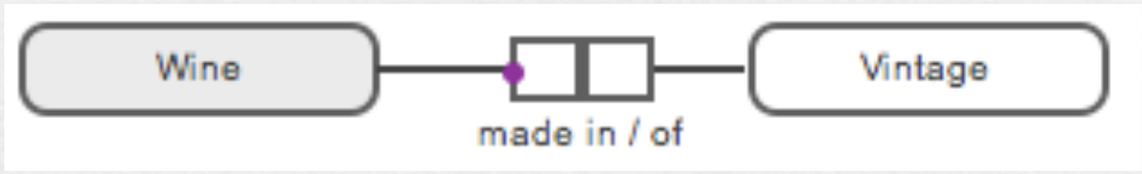
```
<externalUniquenessConstraint>
  <setExpression>
    <lexonBasePath>
      <context>Date and Time</context>
      <headTerm>Year</headTerm>
      <role>of</role>
      <coRole>with</coRole>
      <tailTerm>Date</tailTerm>
    </lexonBasePath>
  </setExpression>
  <setExpression> ... </setExpression>
  <setExpression> ... </setExpression>
</externalUniquenessConstraint>
```



# Mandatory Constraint

each Wine is made in at least 1 Vintage

```
<occurrenceConstraint comparator="greaterThanOrEqual" number="1">
  <setExpression>
    <lexonBasePath>
      <context>Wine Auctions</context>
      <headTerm>Wine</headTerm>
      <role>made in</role>
      <coRole>of</coRole>
      <tailTerm>Vintage</tailTerm>
    </lexonBasePath>
  </setExpression>
</occurrenceConstraint>
```




each Wine is made in exactly 1 Vintage

# Other constraints

- Occurrence constraints
- Subset constraints
- Value constraints

# Auction Commitment

## 3. Interpretation

- Maps paths in RDB to paths in Lexon Base
- Maps XPaths in XML to paths in Lexon Base

```
map /auction/@date on
Date of Auction

map /auction/lot on
Lot part of Auction
...
```

# Conceptual Querying

```
list Name of Wine made in Vintage =
1947
```

- Translates the query to underlying datasources using commitments
- Searches the auction site and wine store DB

# Summary

- DOGMA based specification of ontological commitments
- Close to natural language
- Integrated into DOGMA Studio
- Supports conceptual querying

# Future Work

- Formalization of Ω-RIDL
- Ω-RIDL to Ω-RIDL ML compiler
- Graphical assistance for creating mappings
- Conceptual query interpreter
- Further integration into DOGMA Studio

# Questions

- Thank you for listening!
- Questions?