

Protégé as a Bridge Between the Terminology and Information Model Boundary

Presentation to the 6th Annual
Protégé User's Group

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Aspects of Information

- Terminology
- Information Model
- Processing Model
- Implementation Model

‘Terminology’ From a Medical Context

- A list of code / values
- A classification scheme designed for a specialized purpose
 - ICD-9-CM
 - CPT-4
 - ...
- A full-fledged ‘ontology’ with associated terms, definitions, synonyms & the like
 - GALEN
 - SNOMED-CT



ICD-9-CM Sample

Example



SNOMED-CT Sample

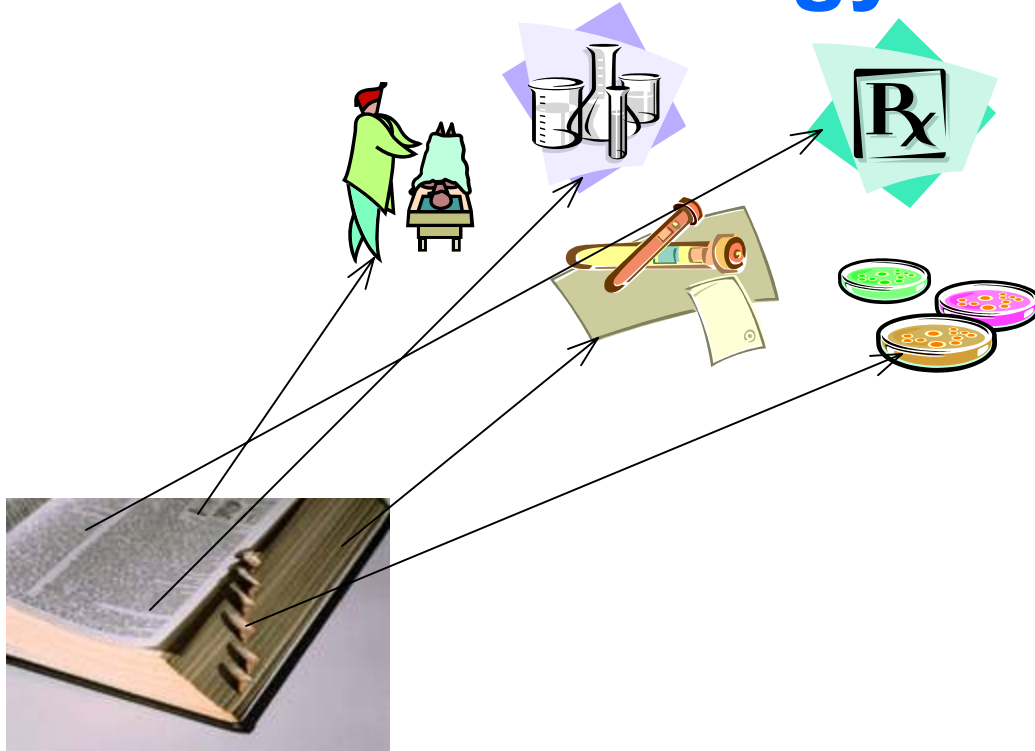
[Clue Browser](#)

Terminology

- Represents a cross section of some ‘reality’
- *Defines* the meaning of the symbols or tokens used in various forms of discourse
- Information rich, fractal and expanding
- Managed with a variety of tools and techniques such as DL’s graphical browsers, lexical searches, etc.



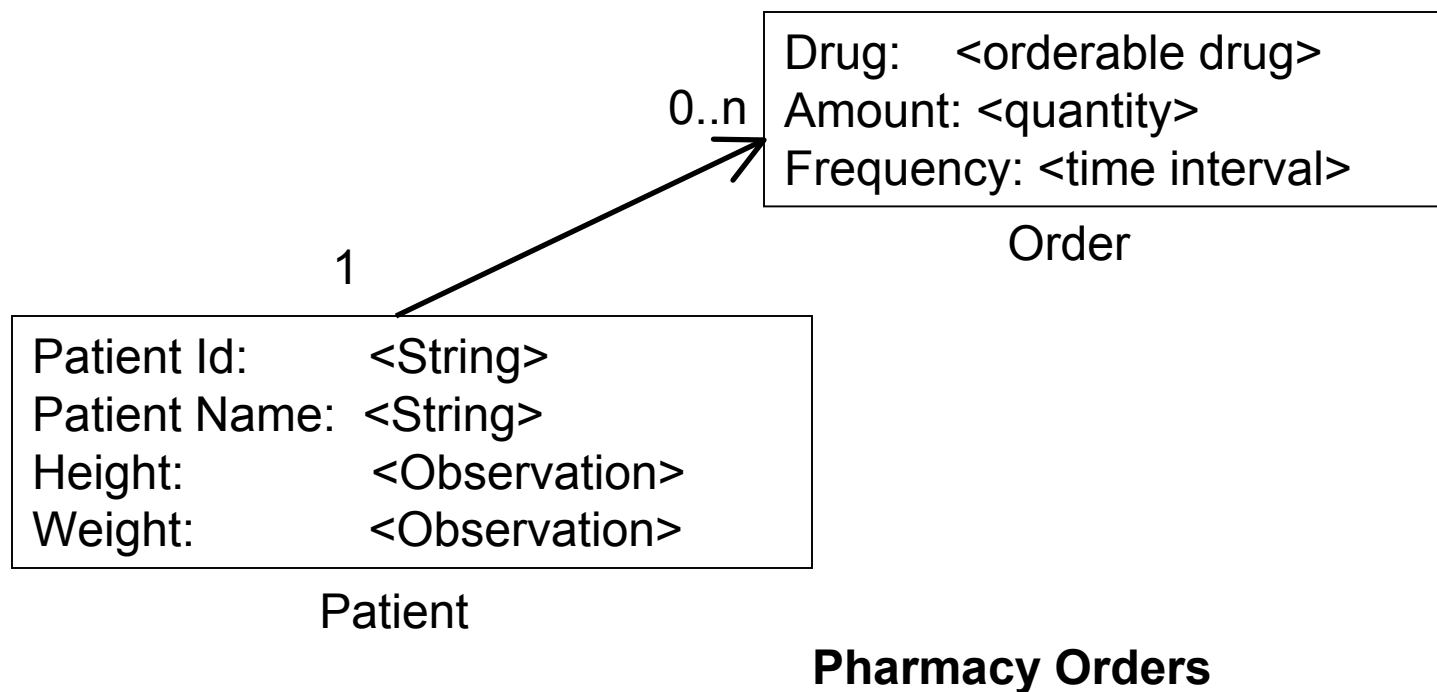
Terminology



Information Model

- Selects the subset of the 'real world' to be discussed in a given context
- Utilizes elements in the terminology
- Tacit or explicit agreements on what is to be:
 - Ignored
 - Refined
 - Expanded and augmented
- Extends the terminology model with non-definitional characteristics

Information Model



Processing Model

- References Information Model Elements and Instances
- Extends the Terminology Model with non-definitional knowledge
 - Distinction is not clear
 - Continues to augment and build terminology
- Defines the rules for state changes in instances of the information model.

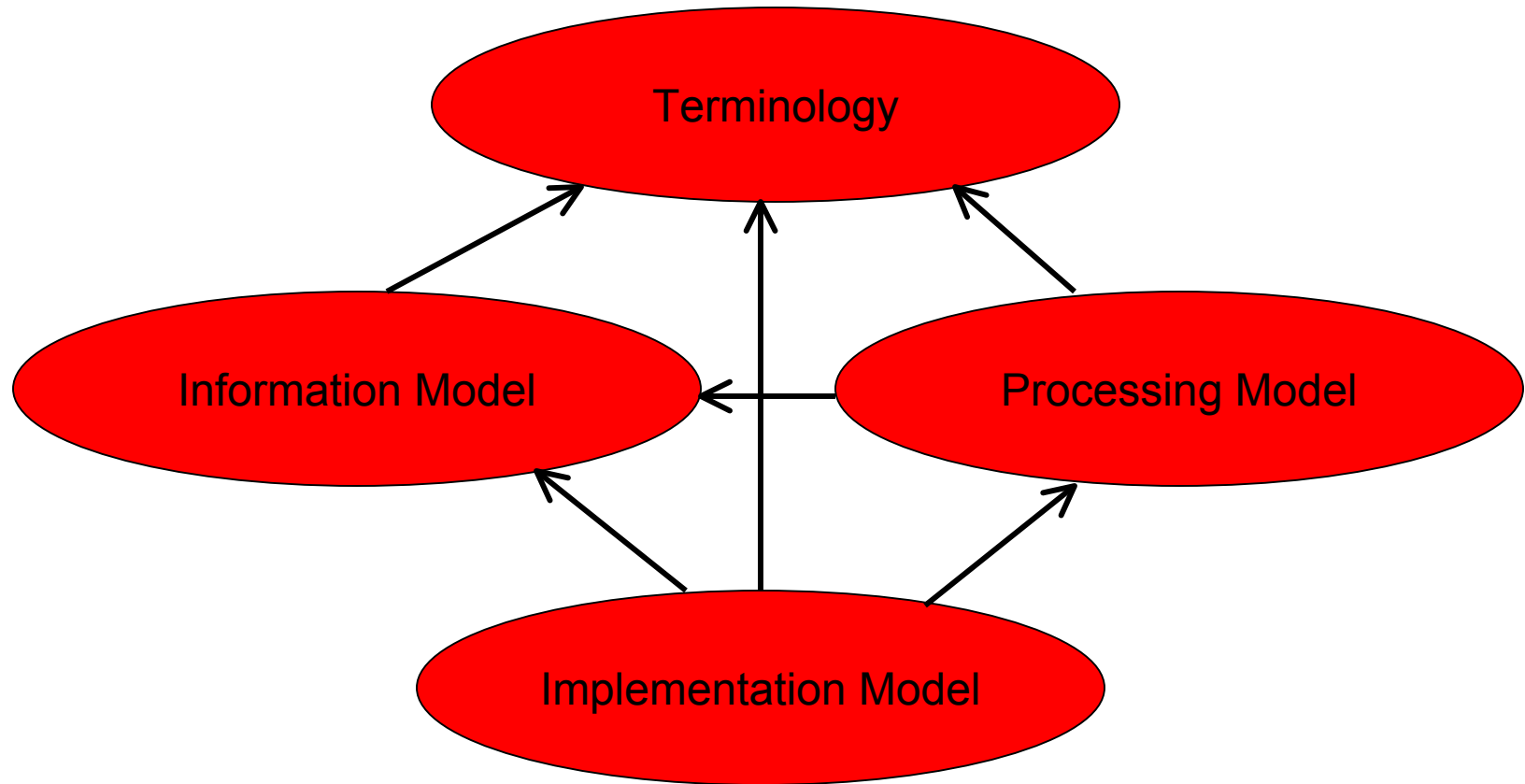
Implementation Model

- Defines how instances of the information model are represented
- Must be consistent with terminology, information and processing models
- Many possible ways to represent the same:
 - Symbols or tokens
 - Information
 - Processing rules



Dependencies

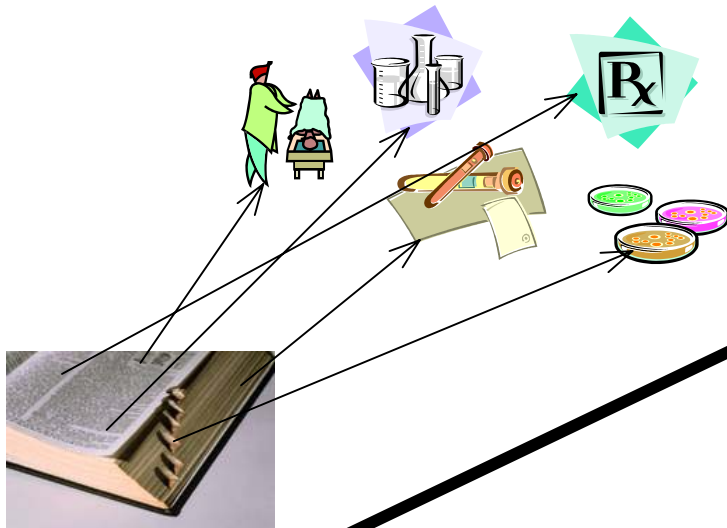
(Borrowing heavily from RM-ODP)





Linking Terminology and the Information Model

How Do We Link...



Drug: <orderable drug>
Amount: <quantity>
Frequency: <time interval>

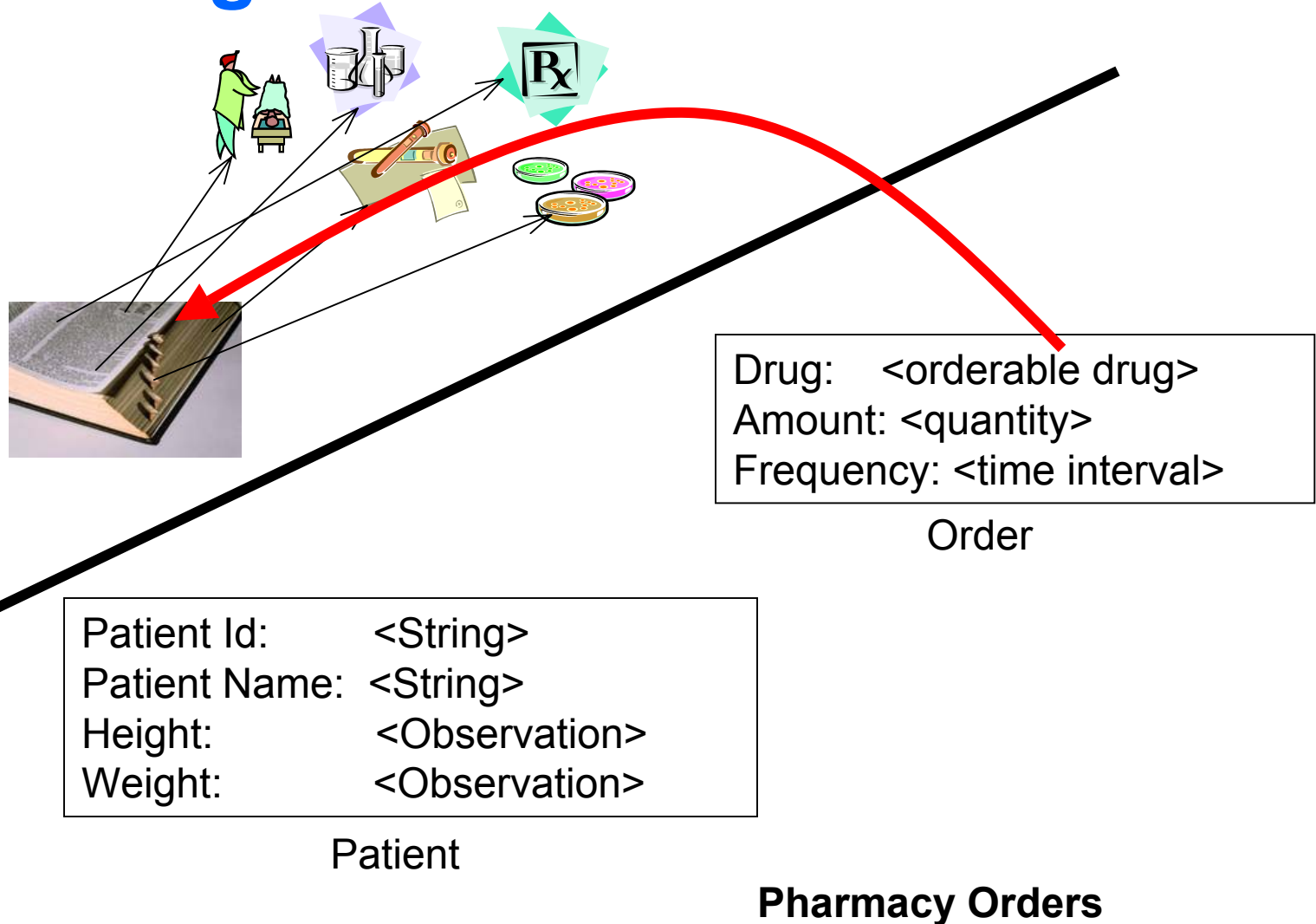
Order

Patient Id: <String>
Patient Name: <String>
Height: <Observation>
Weight: <Observation>

Patient

Pharmacy Orders

Linking at the Attribute Level



Linking The Terminology and Information Model

full immunization

See: Expression/Criterion/Presence_criterion/Intervention_presence_criterion

See: Terminological_concept/Procedure/Hep_B vs. First Hep_B



Linking Only at the Attribute Level Issues

- Information model begins to resemble terminology model (surprise...)
- Structures may not align
- Nodes may be misinterpreted
- May make it impossible to correctly connect to the implementation...

Linking Only at the Attribute Level

Coded Concept: **immunization consent**
Value: **refused**

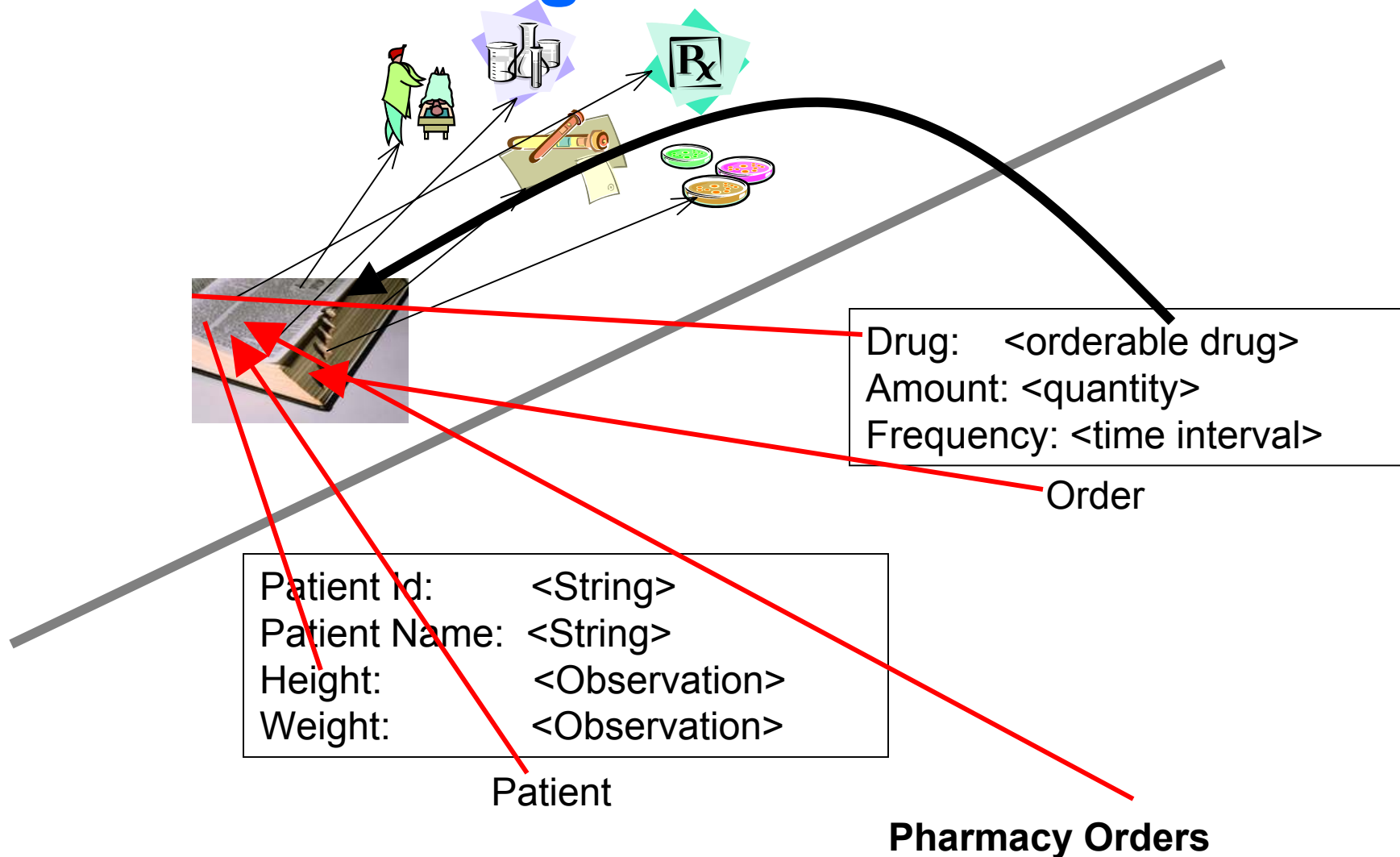
How does this correspond to: **no consent - Hemophilus influenzae type B immunization?**

How about not(**full consent for immunizations**) ?

The Solution

- Terminology and the Information Model need to be “joined at the hip”
 - Terminology provides definitions for all parts of the information model
 - Information model and terminology definitions can be tested for compatibility
 - Information model serves to validate and extend the terminology

Linking at All Levels

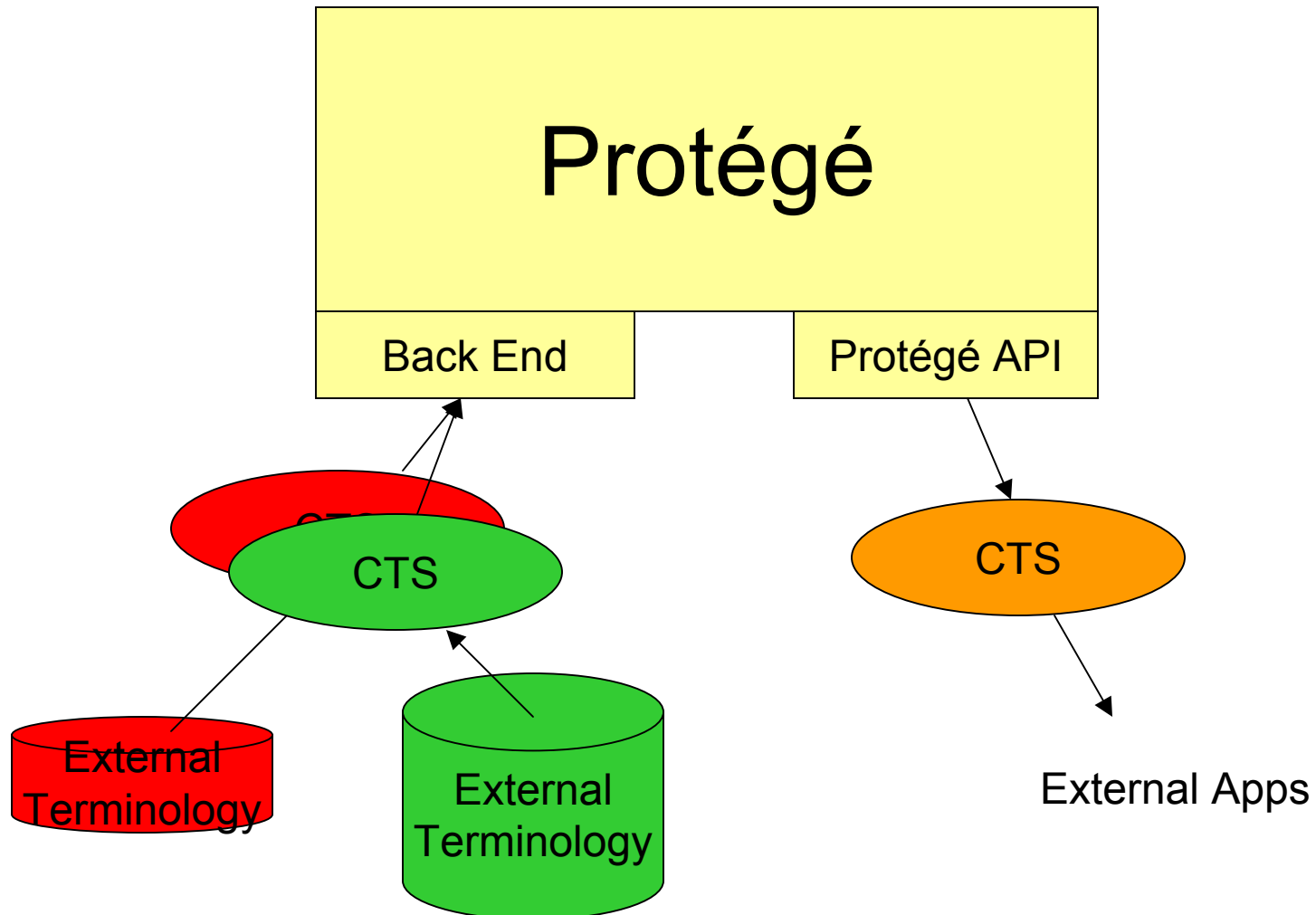


Example

[Link](#)

Approach

Proposed Approach



Common Terminology Services CTS

- Proposed HL7 Standard
- Common Browsing and Runtime API to Terminology Content
- Enables heterogeneous implementations

The Opportunity

- Protégé provides a setting that allows the terminology model, the information model and the process model to co-exist in one common interface
 - Terminology model: Protégé / classifiers and other ontology editing tools
 - Information model: Protégé / UML
 - Processing model: Protégé / UML / ...
 - Implementation model: ?

Acknowledgements

NLM 1R01LM007319-01A1

"Development and Evaluation of Terminology Services"

NIST FAA 70NANB1H3049

"Standards-Based Sharable Active Guideline Environment"