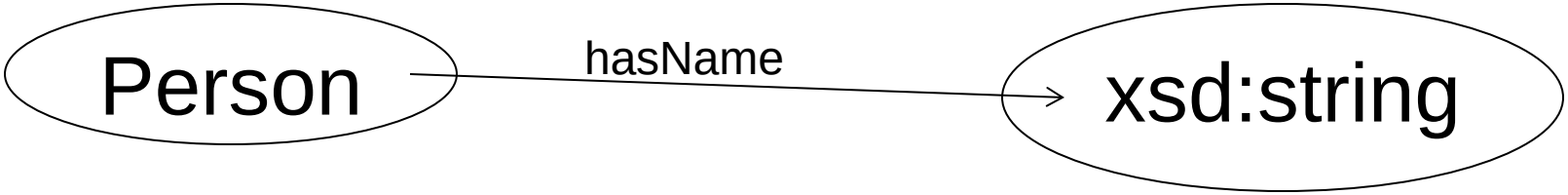
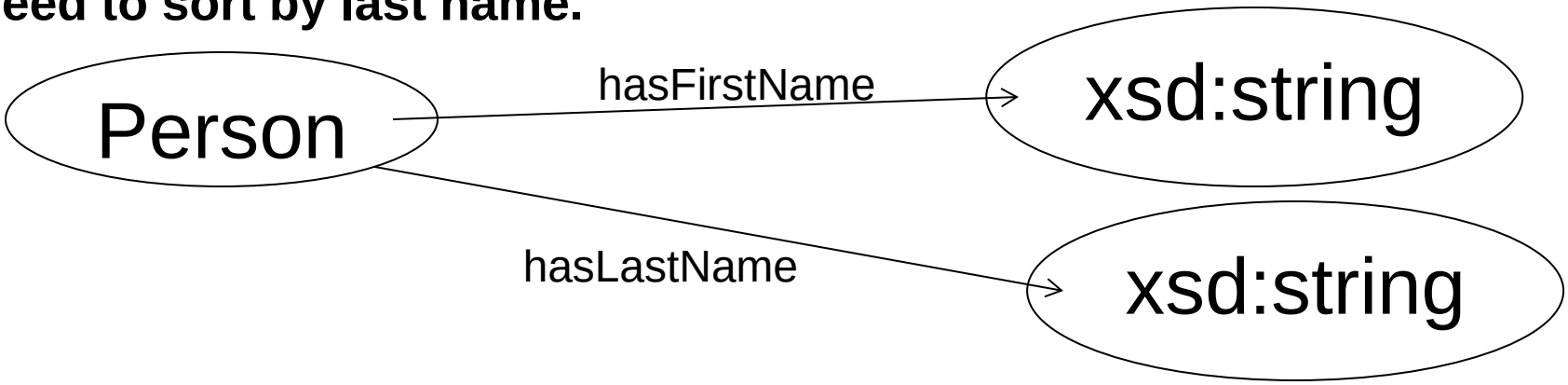
On the problem of ontological commitments and how to address it

Pascal Hitzler
DaSe Lab for Data Semantics
Wright State University
http://www.pascal-hitzler.de

Names



“I need to sort by last name.”



“My name is “Artur d’Avila Garcez”. I’m Brazilian of Spanish descendancy.

“My first name is Anna-Maria, but I live in the U.S. and the ID systems didn’t accept a hyphen in my name.

“My name is Pan Ji. What do you mean by ‘last name’?”

“My name actually changed recently ...”

Ontological Commitments

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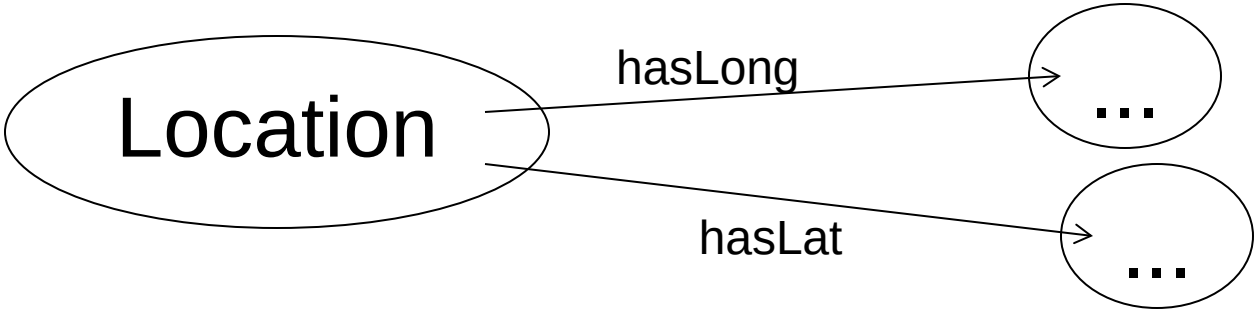
a.k.a.

modeling choices you may regret later

Locations



I actually need to know the degree of certainty.

I don't need an uncertainty value, I need a probability distribution.

So with what device was that measured and when?

I'm working with historical data, how do I specify the prime meridian?

Ontological Commitments

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Whenever you decide on how to make your metadata

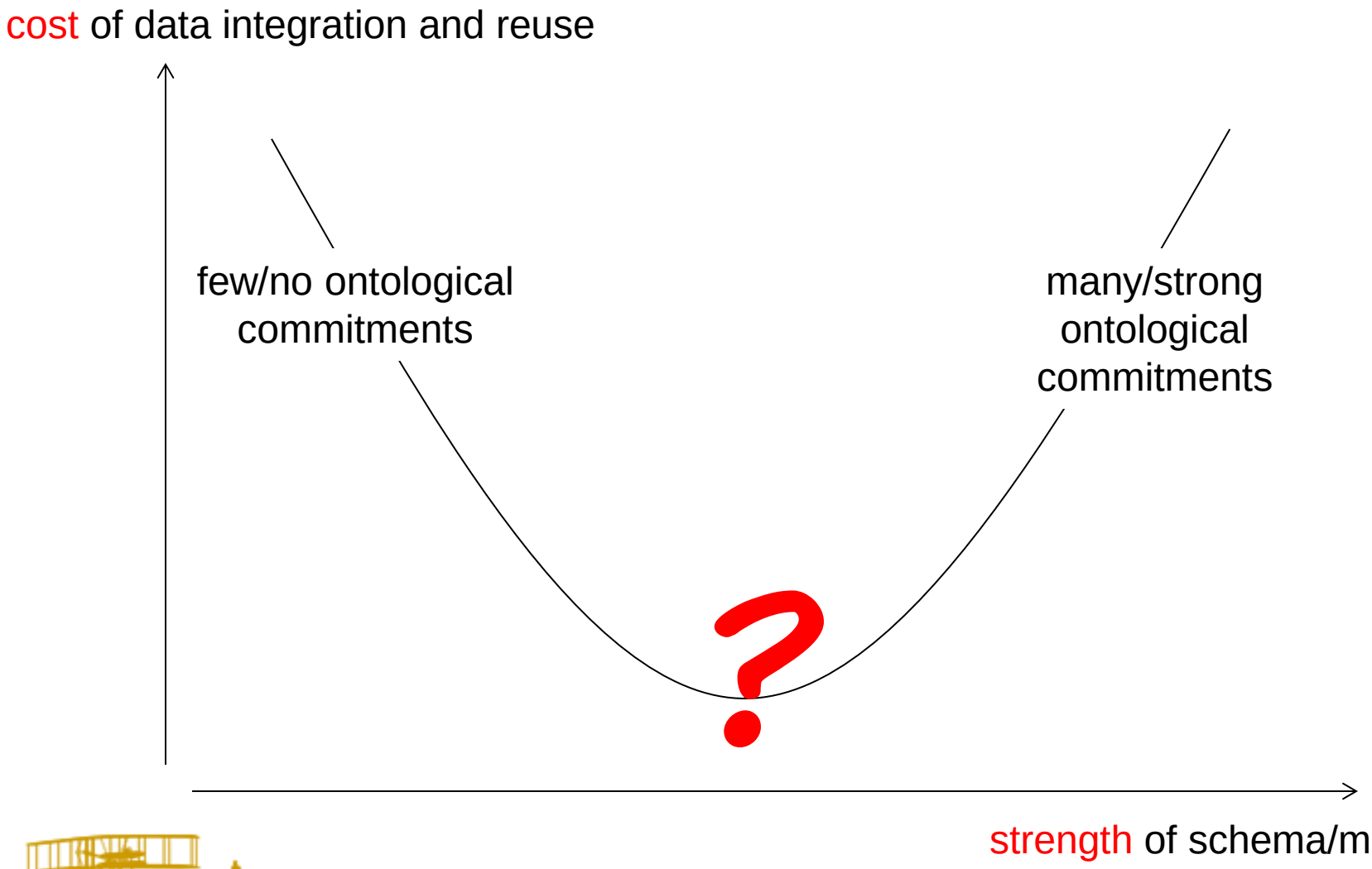
- **keyword annotation**
- **controlled vocabularies**
- **light-weight taxonomy**
- **full-blown ontology**

You always have to make specific modeling decisions.

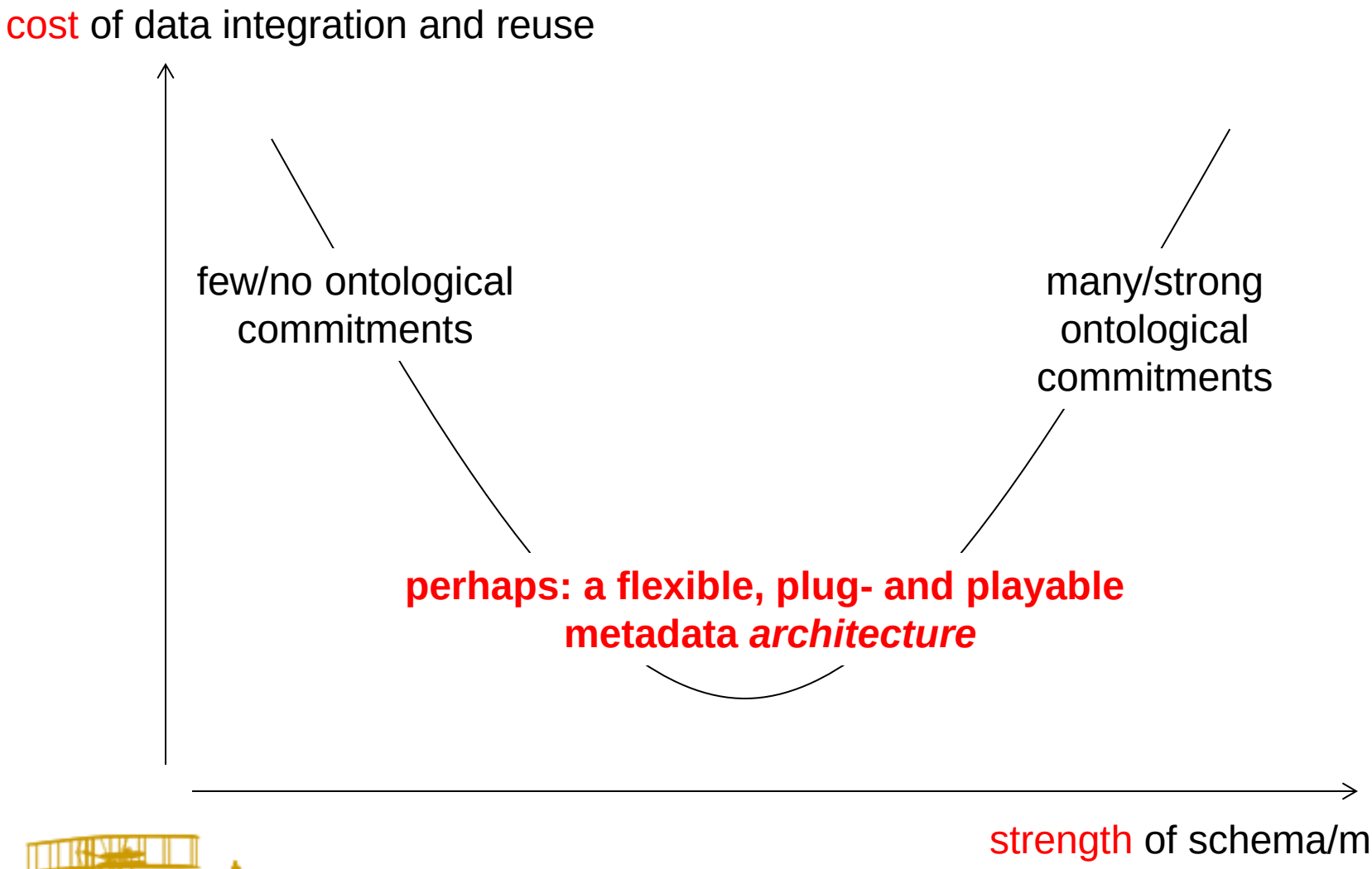
You can either make detailed specifications (ontological commitments) which will often hinder reuse for new purposes.

Or you can avoid the commitments, resulting in ambiguity which cannot really be resolved later, thus also hindering reuse.

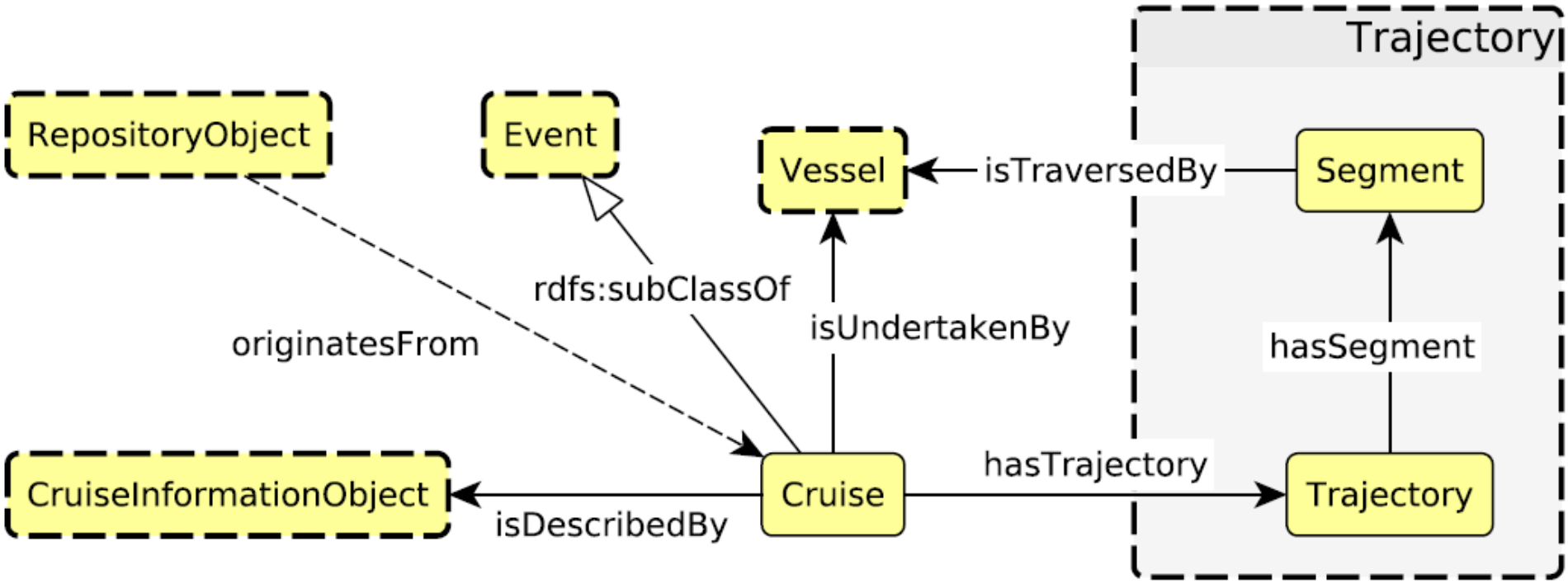
Soft Spot Search



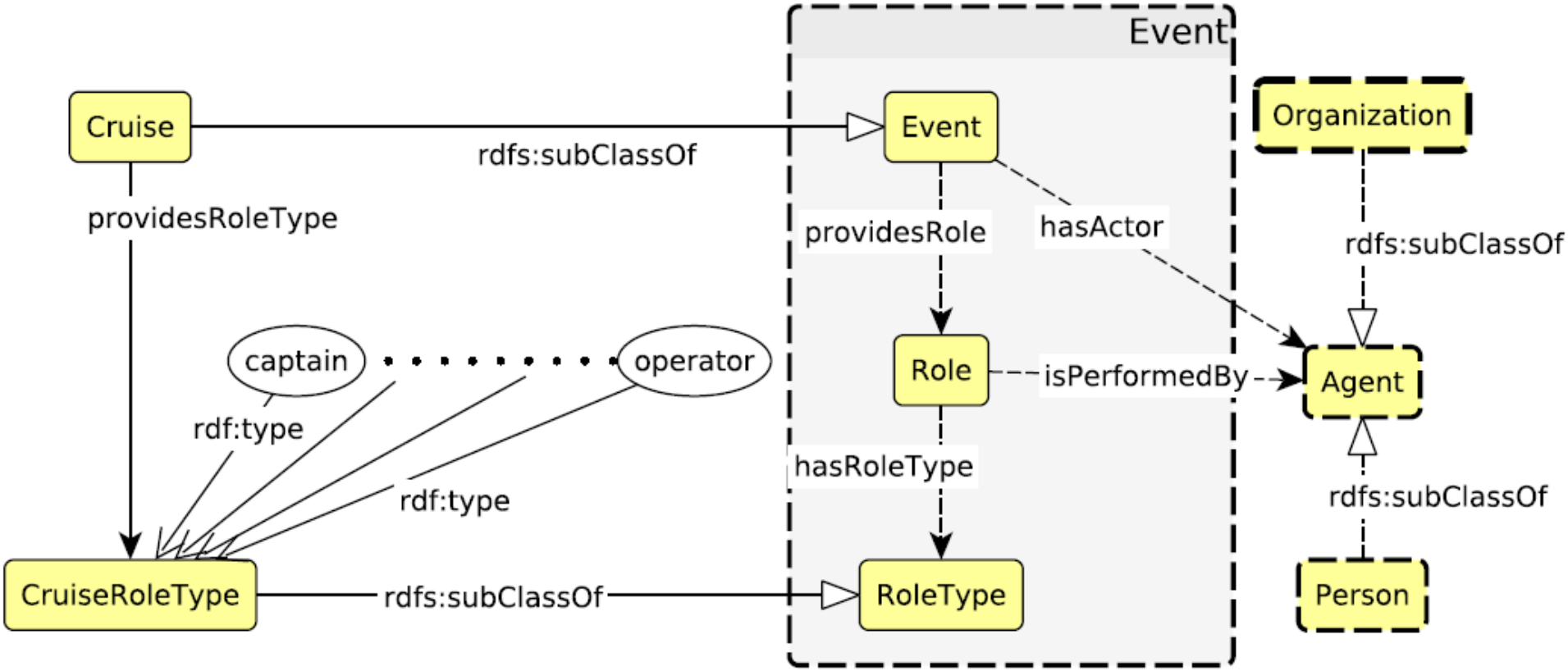
Soft Spot Search



Oceanographic Cruise



Cruise as Event



Ontology Design Patterns

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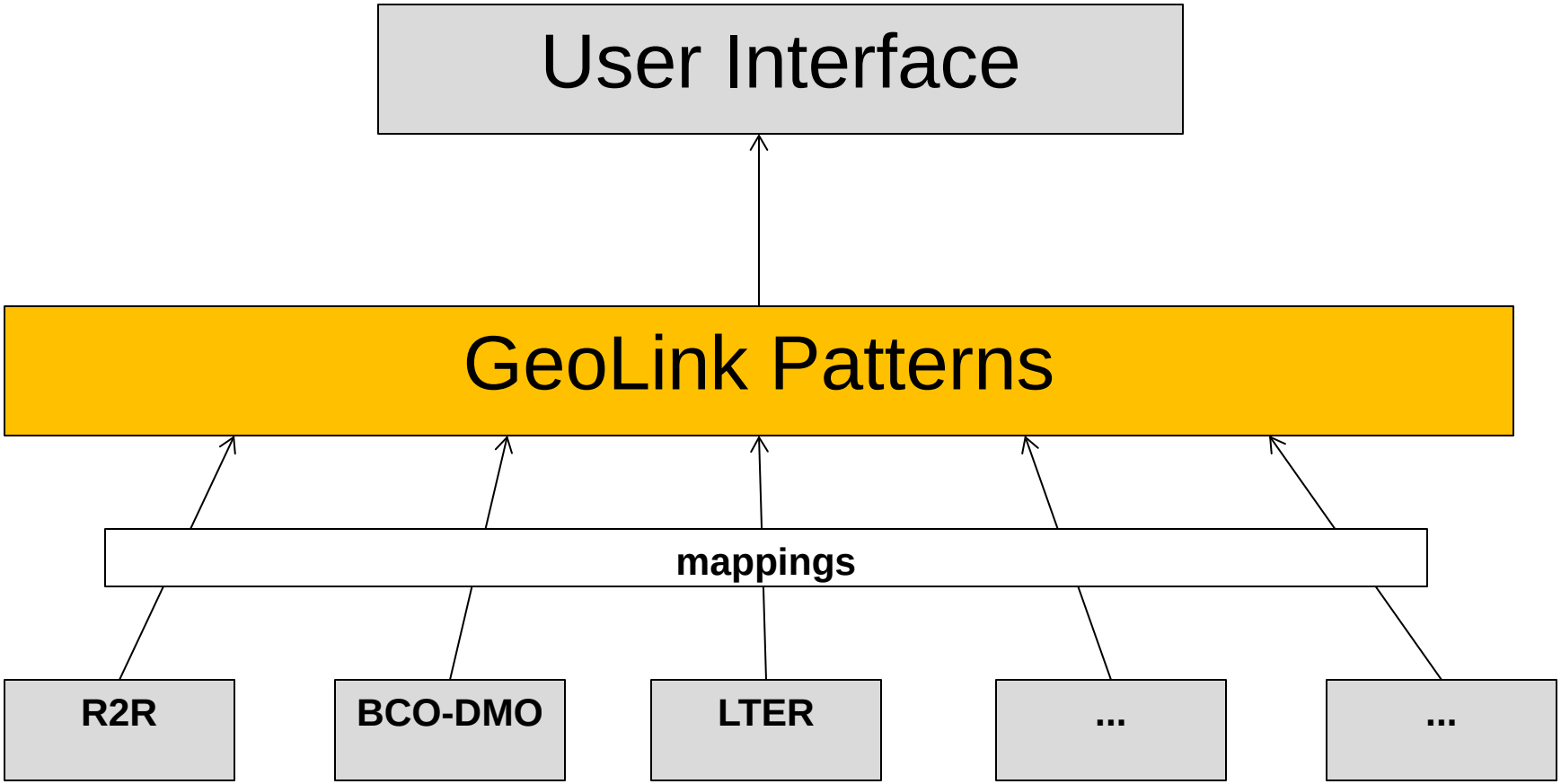
“An ontology design pattern is a reusable successful solution to a recurrent modeling problem.”

So-called *content patterns* usually encode specific abstract notions, such as process, event, agent, etc.

Patterns provide modular, reusable, replaceable, pieces.

Patterns can be configured as a flexible, modular, “plug-and-play” metadata ecosystem in which patterns can be exchanged as needed.

GeoLink setup

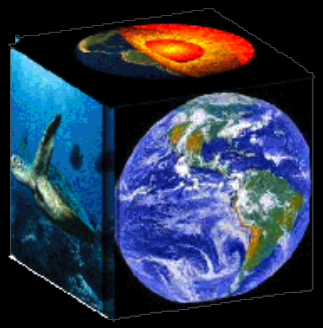


Thanks!

www.geolink.org

EarthCube requires

- information integration
- interoperability
- conceptual modeling
- intelligent search
- data-model intercomparison
- data publishing support



Semantic Web studies

- information integration
- interoperability
- conceptual modeling
- intelligent search
- data-model intercomparison
- data publishing support

Pascal Hitzler, WSU; Krzysztof Janowicz, UCSB

EarthCube Challenges

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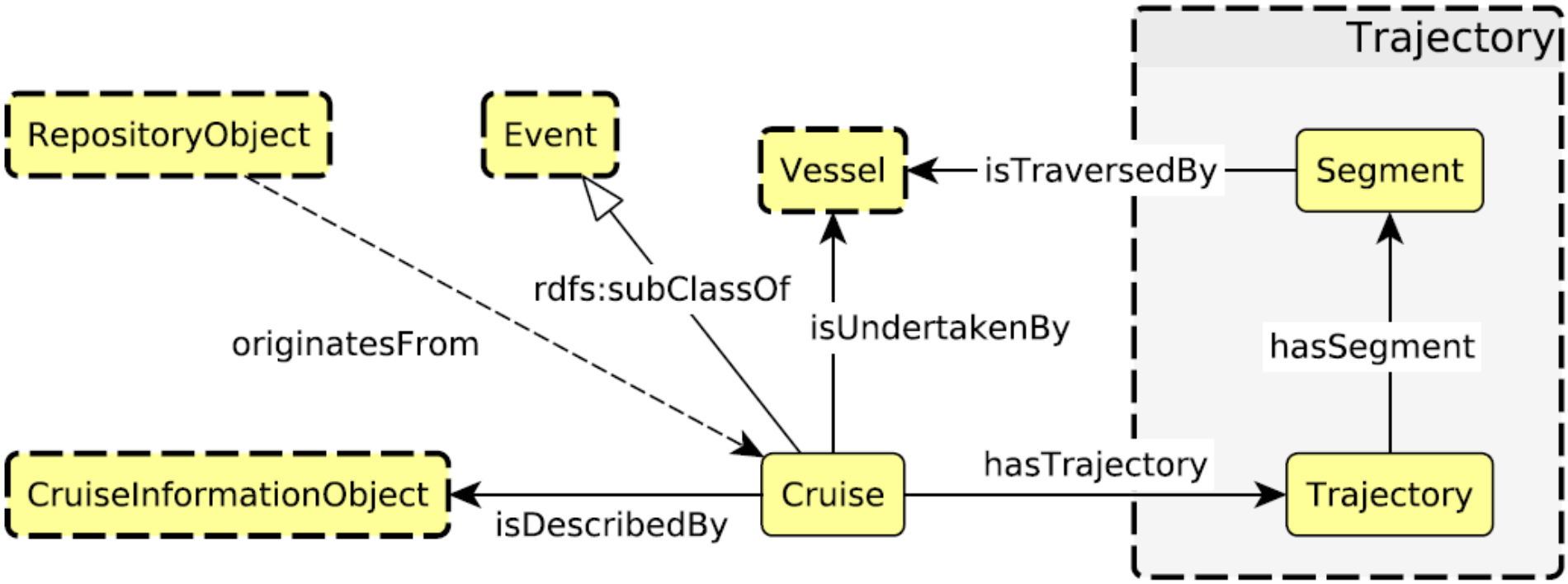
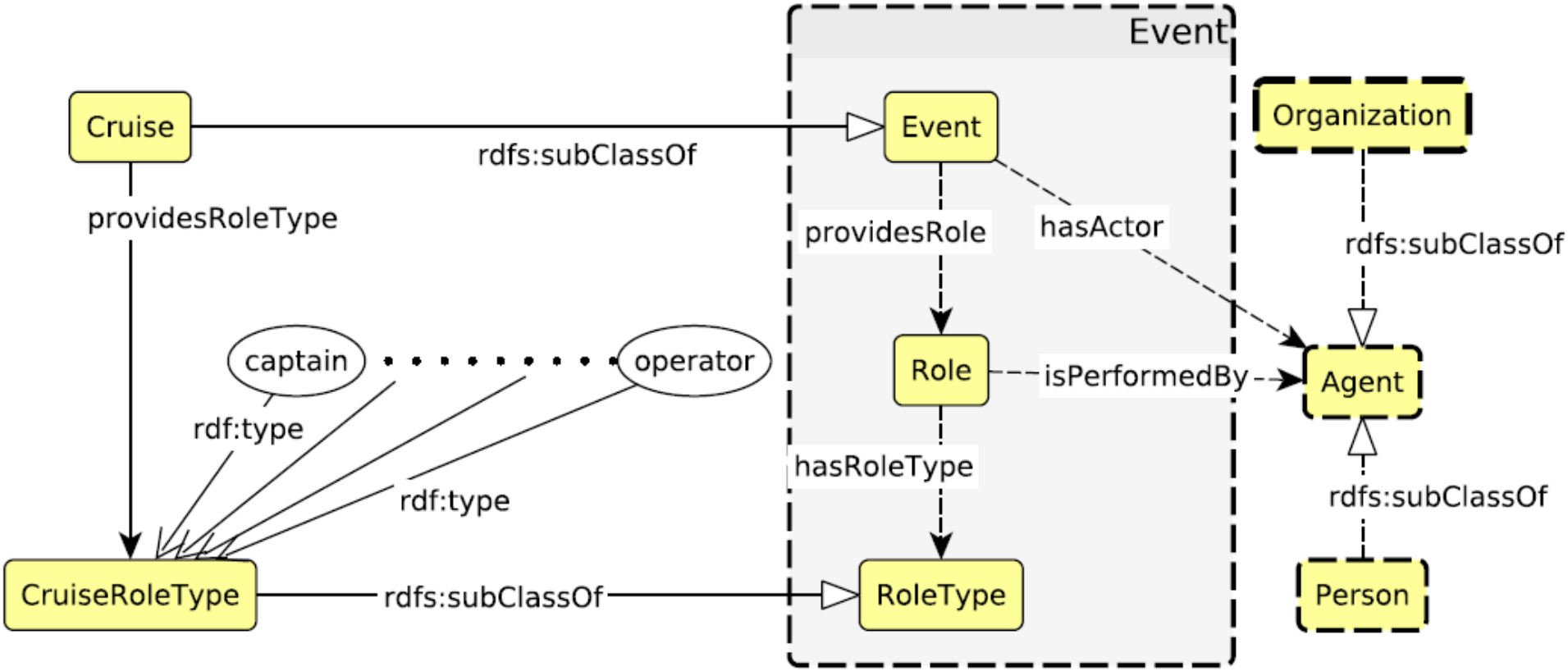
The EarthCube "Architecture" must be

- **modular**
- **extensible**
- **sustainable**
- **sliceable (i.e. you can adopt part of it without adopting all)**
- **simple enough for easy adoption**
- **complex enough to solve real problems**
- **scalable in terms of breadth of topic coverage**
- **elastic, in that it allows partners to decide how much they want to share**
- **respectful of individual modeling choices**

Oceanographic Cruise



Roles (Cruise as Event)



Cruise Trajectories

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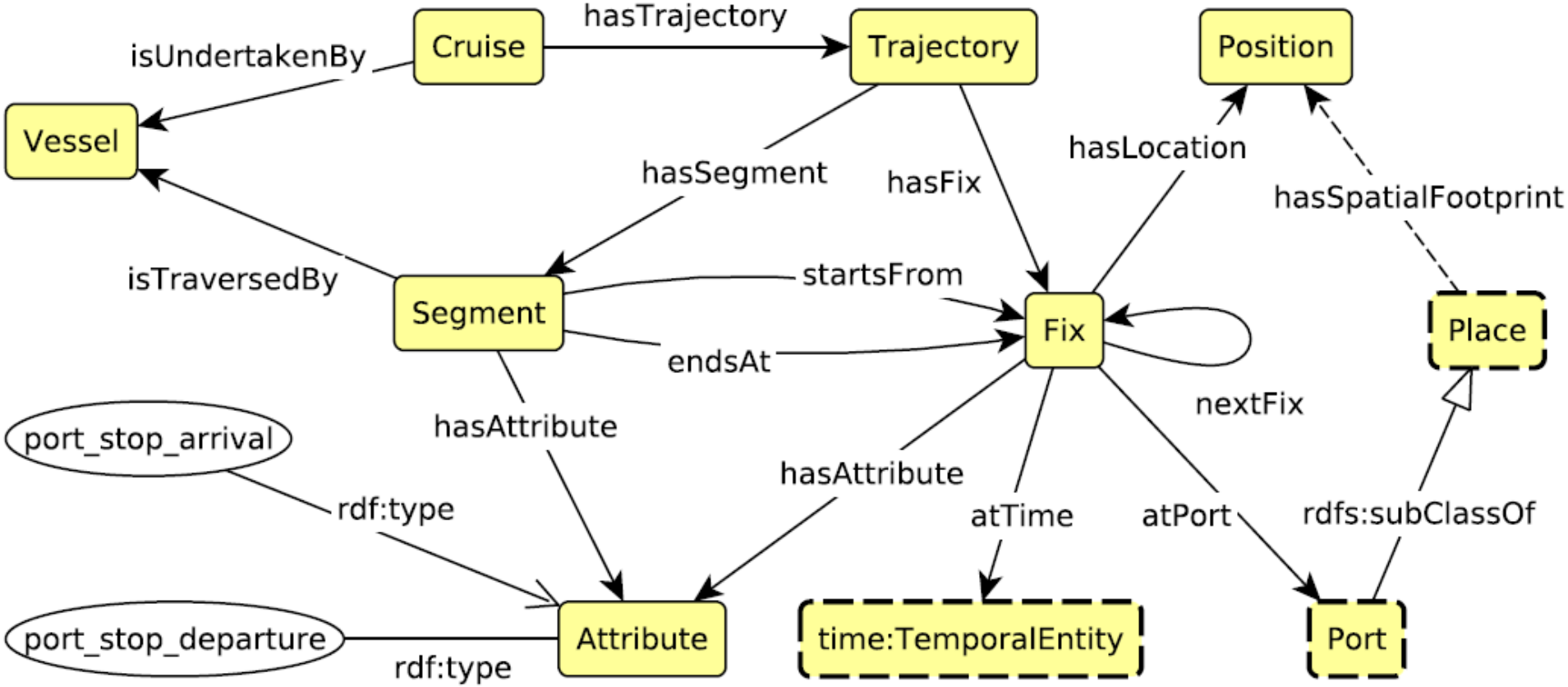
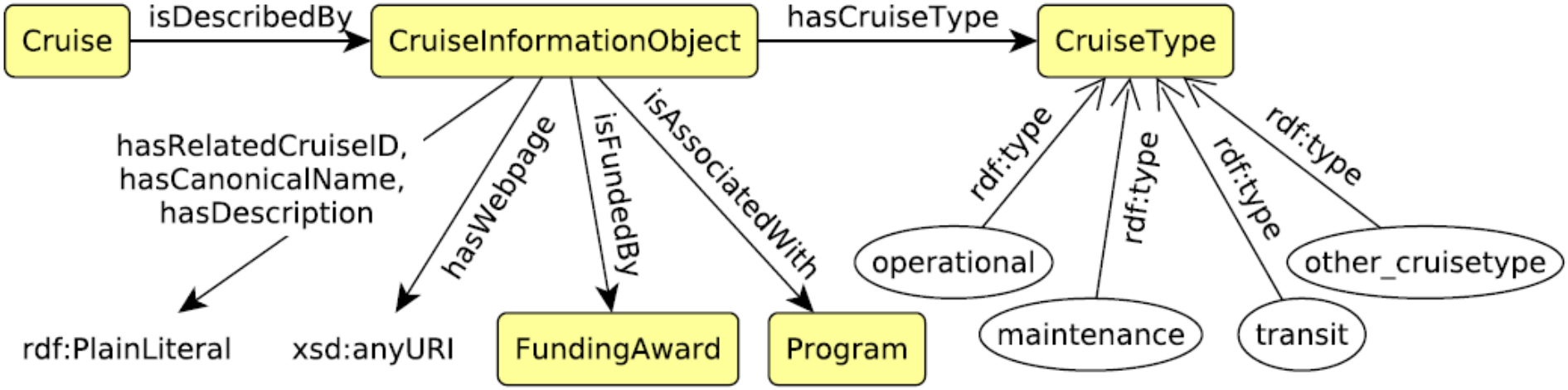


Information Objects



GeoLink

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We show that our approach meets the mentioned EarthCube challenges, by significantly extenting depth and breadth of topic coverage

LDEO: Robert Arko, Suzanne Carbotte, Kerstin Lehnert

WHOI: Cynthia Chandler, Peter Wiebe, Lisa Raymond, Adam Shepherd

UCSB: Mark Schildhauer, Krzysztof Janowicz, Matt Jones, Yingjie Hu

Ocean Leadership: Douglas Fils

Marymount Univ: Thomas Narock

WSU: Pascal Hitzler, Michelle Cheatham, Adila Krisnadhi

UMBC: Tim Finin

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