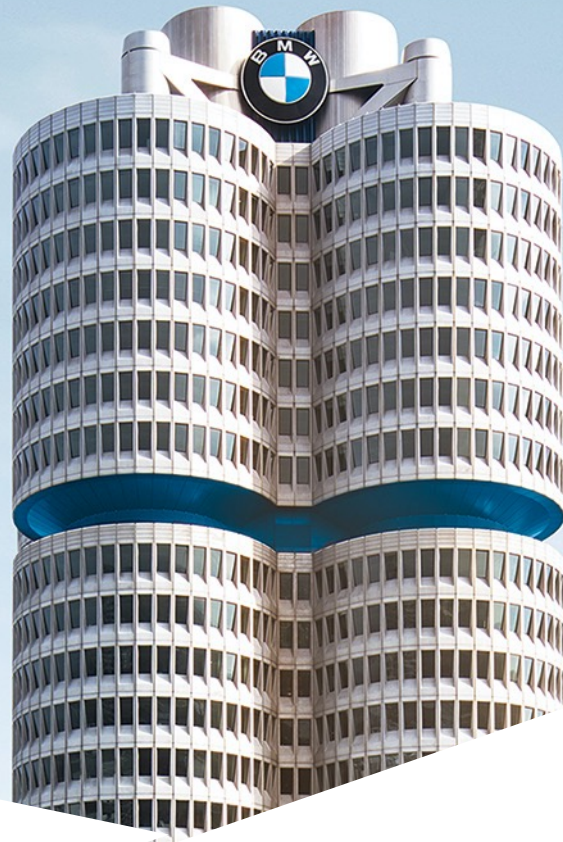


XDVP

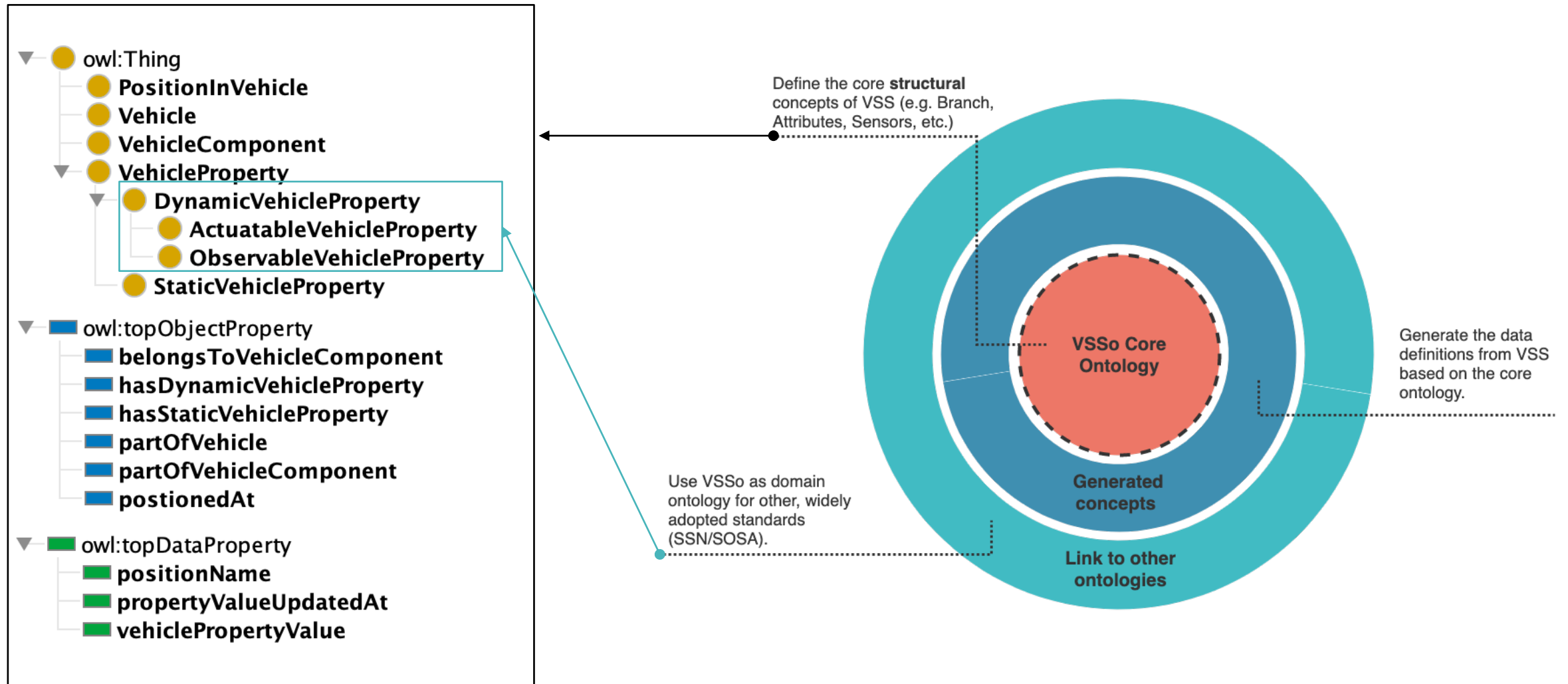
ontology eXtension for Dynamic Vehicle Properties



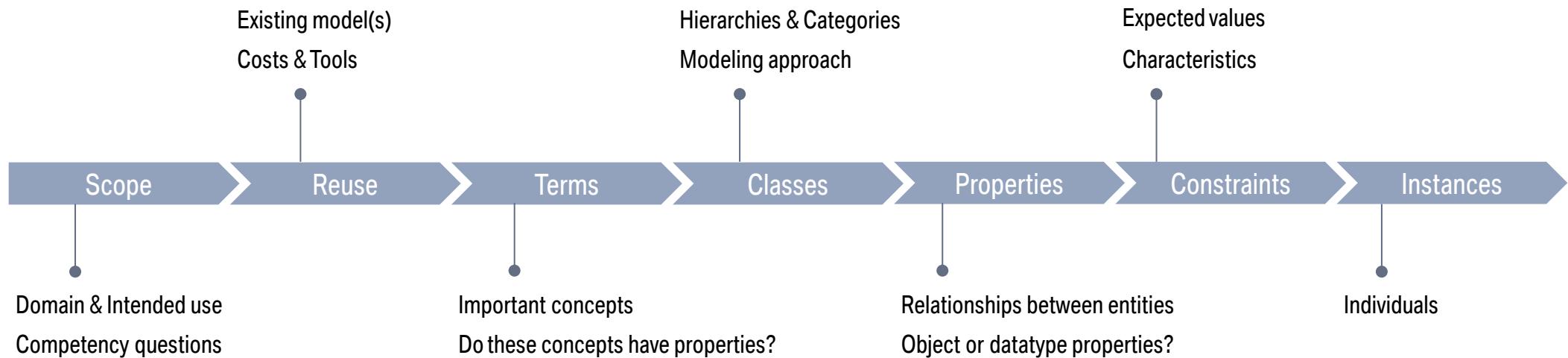
March 2022
Daniel Alvarez-Coello



EXTENDING VSSO TO HANDLE DATA STREAMS.



DESIGNING THE ONTOLOGY EXTENSION.



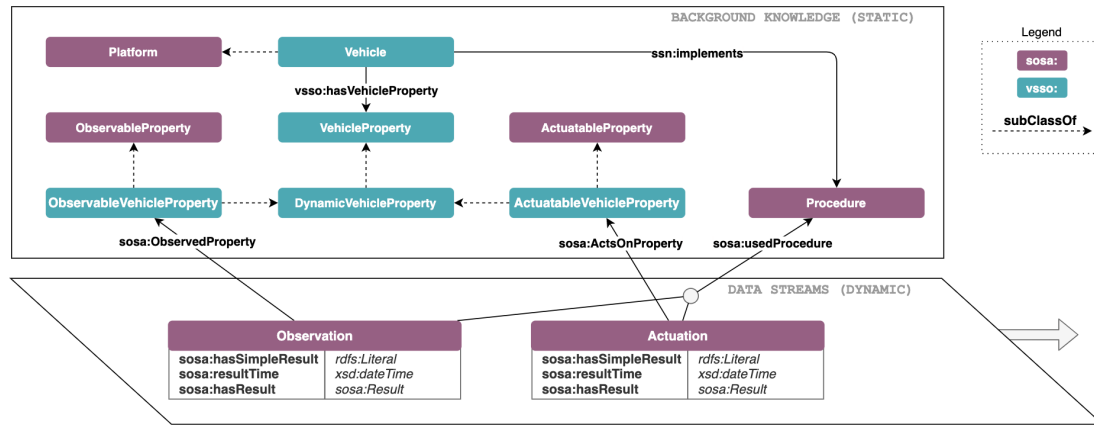
Dynamic Vehicle Properties → Data in motion (i.e., time-series data, or more generically data streams)

- What event occurred the most in journey J ?
- How many driving journeys does vehicle V have in
 - ..total,
 - ..the last month,
 - ..the last 10 days, etc?
- What methods and parameters are applied to analyze the stream S ?
- In which time windows is the value V observed in the stream S ?
- What is the feature F (e.g., average, max, min, etc.) of a given time window?
- What is the quantity type associated to the stream S ?
- What is the unit of the observation of the stream S ?
- What is the topic of the stream S ?
- When did the value of the stream S changed from $V1$ to $V2$?
- Where does the stream S derive from?
- During a given event E ,
 - what is the $feat_A$ of DVP_A when another DVP_B has a $value_B$?

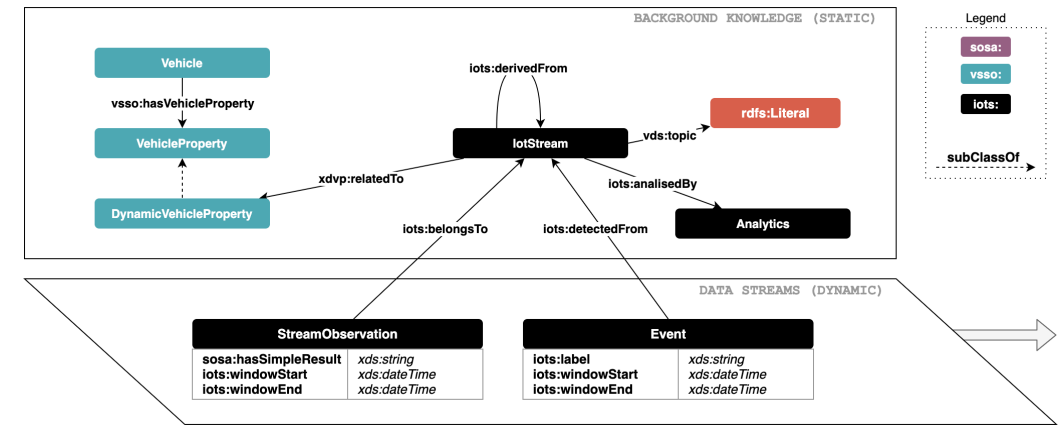
- **VSSo-core**
 - Specially vsso-core:DynamicVehicleProperty
- **Semantic Sensor Network (SSN)**
 - Vehicle as a sensing platform that implements procedures
- **Sensors, Observations, Samples, and Actuators (SOSA)**
 - Vehicle properties can be observed and (some of them) acted on
 - Low-level representation of the data streams (i.e., individual observations and actuations)
- **IoT-Stream**
 - Data streams are described by the sequential occurrence of events and stream observations
 - High-level representation of the data streams (i.e., aggregated meaning of the sequences)
- **Quantities, Units, Dimensions and dataTypes (QUDT)**
 - Value(s) of data streams as either numerical (with a unit) or categorical (unitless)



Exploration of diagram and ontology



VSSo + SOSA



VSSo + IoTStream

OPEN MODELING TRADE-OFFS.

- **How strict one should be?**
 - rdfs domain and range (i.e., inferencing), or
 - schema.org domainIncludes and rangeIncludes
- **What would be the preferred vocabulary for working with units and quantity kinds?**
 - QUDT
 - OM
 - Other?
- **Deal with event values as literals vs. a hierarchy of individuals?**
- **Other aspects..**
 - More details would be socialized once the ongoing VSSo main modeling decisions are made