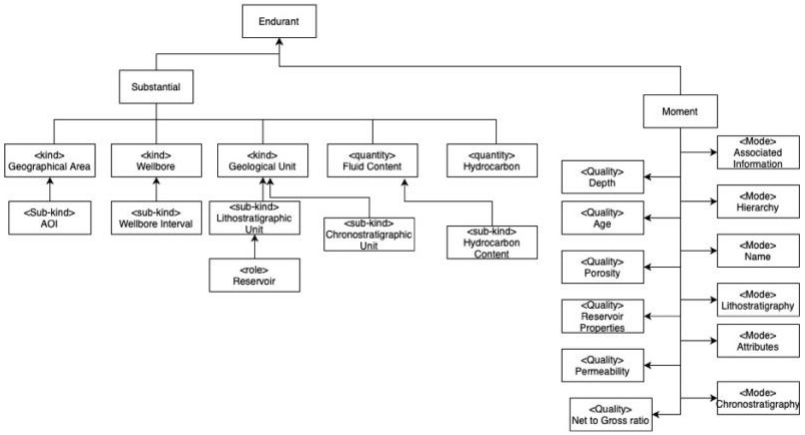
Domain of modeling is the Ontology based data access for Subsurface. Conceptualization needed for such application is based on two things. First, the available G&G data, Geological domain knowledge. The overall scope is limited by some complex end user queries. Following is an example text form a couple of queries.

- In my area of interest (AOI) return the wellbores that penetrates chronostrat unit <C1> and return information about the lithostratigraphy and the hydrocarbon content (saterated and moveable + shows) in the wellbore interval that penetrates the <C1> unit. Also return information about other wellbore intervals with hydrocarbon content (saterated and moveable + shows) in the wellbores with hydrocarbon in <C1>.
- Return the wellbores that do not penetrate chronostrat unit <C1> and give information about why they do not. Possible outcomes of why not: Not drilled far enough, eroded, not deposited, missing due to faulting
- In my AOI, return wellbores with reservoir
- If there is reservoir, then give associated information (overlapping 3d line intervals with attributes + ?3d points with attributes)
- Chronostratigraphy (wellbore interval with name, hierarchy, top and base age, top and base depth (MD RKB, TVD MSL,..). Lithostratigraphy (wellbore interval with name, hierarchy, top and base depth (MD RKB, TVD MSL,..). Hydrocarbon content (saturated and moveable, residual, shows). Reservoir properties: Porosity, permeability, Net to Gross ratio, Net thickness (MD), Net thickness (TVD)

Based on UFO

Concept	Supply identity(O)	Carry identity (I)	Rigid (R)	Unity	Relacional Dependence (DR)	Existential Dependence (DE1)	Existential Dependence DE2	Meta-type
AOI	O-	I+	R+	U+	DR-	ED1+	ED2-	Sub-Kind
Wellbore	O+	I+	R+	U+	DR-	ED1-	ED2-	Kind
Chronostratigraphic Unit	O-	I+	R+	U+	DR-	ED1-	ED2-	Sub-Kind
Lithostratigraphic Unit	O-	I+	R+	U+	DR-	ED1-	ED2-	Sub-Kind
Hydrocarbon	O+	I+	R+	U-	DR-	ED1-	ED2-	Quantity
Fluid Content	O+	I+	R+	U-	DR-	ED1+	ED2-	Kind
Wellbore Interval	O-	I+	R+	U+	DR-	ED1+	ED2-	Sub-Kind
Hydrocarbon Content	O-	I+	R+	U-	DR-	ED1+	ED2-	Sub-Kind
Reservoir	O-	I+	R~	U-	DR+	ED1-	ED2-	Role
Associated information	O-	I-	R~	U-	DR-	ED1+	ED2-	Mode
Attributes	O-	I-	R~	U+	DR-	ED1+	ED2-	Mode
Geological Unit) Age	O-	I+	R+	U+	DR-	ED1+	ED2-	Quality
(Geological Unit) Depth	O-	I-	R~	U+	DR-	ED1+	ED2-	Quality
(Geological Unit) Hierarchy	O-	I+	R+	U-	DR-	ED1+	ED2-	Mode
(Geological Unit) Name	O-	I+	R+	U+	DR-	ED1+	ED2-	Mode
(Geological Unit) Reservoir properties	O-	I-	R~	U+	DR-	ED1+	ED2-	Quality
(Geological Unit) Porosity	O+	I-	R~	U+	DR-	ED1+	ED2-	Quality
(Geological Unit) Permeability	O+	I-	R~	U+	DR-	ED1+	ED2-	Quality
(Geological Unit) Net to Gross Ratio	O+	I-	R~	U+	DR-	ED1+	ED2-	Quality
(Geological Unit) Lithostratigraphy	O-	I+	R~	U+	DR-	ED1+	ED2-	Mode
(Geological Unit) Chronostratigraphic	O-	I+	R+	U+	DR-	ED1+	ED2-	Mode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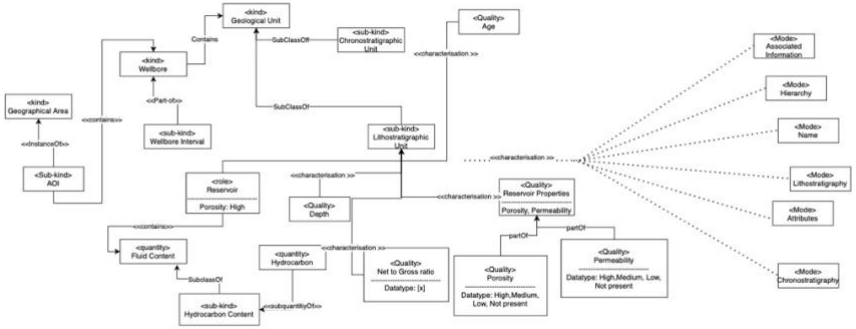
Chronostratigraphy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partOf
SubclassOf
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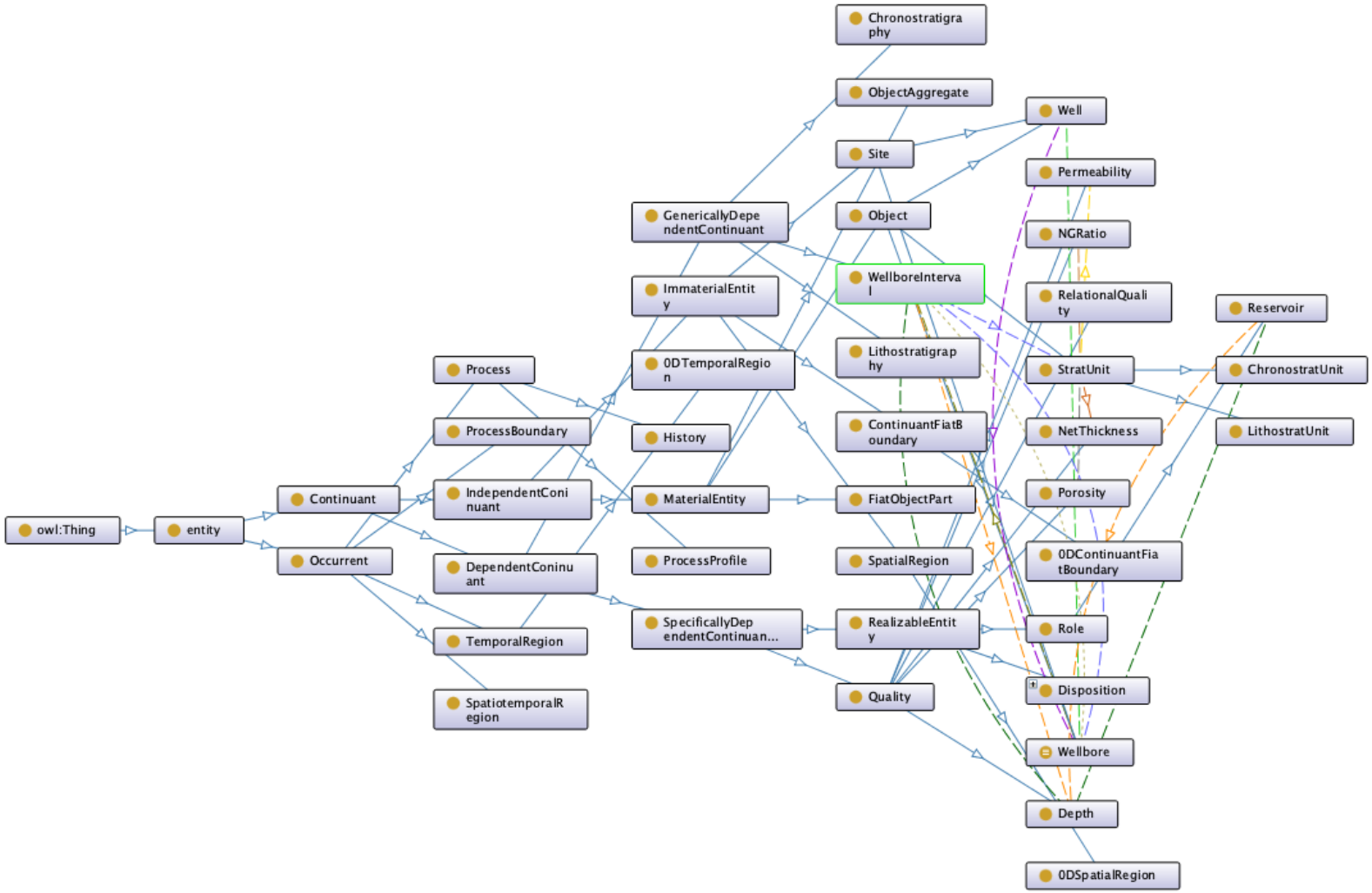
Datatype: [x]
Datatype: High,Medium, Low, Not present
Datatype: High,Medium, Low, Not present

Based on BFO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Occurrent
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ProcessBoundary
IndependentConinuant
DependentConinuant
TemporalRegion
SpatiotemporalRegion
GenericallyDependentContinuant
ImmaterialEntity
0DTemporalRegion
History
MaterialEntity
ProcessProfile
SpecificallyDependentContinuan...
Chronostratigraphy
ObjectAggregate
Site
Object
WellboreInterval
Lithostratigraphy
ContinuantFiatBoundary
FiatObjectPart
SpatialRegion
RealizableEntity
Quality
Well
Permeability
NGRatio
RelationalQuality
StratUnit
NetThickness
Porosity
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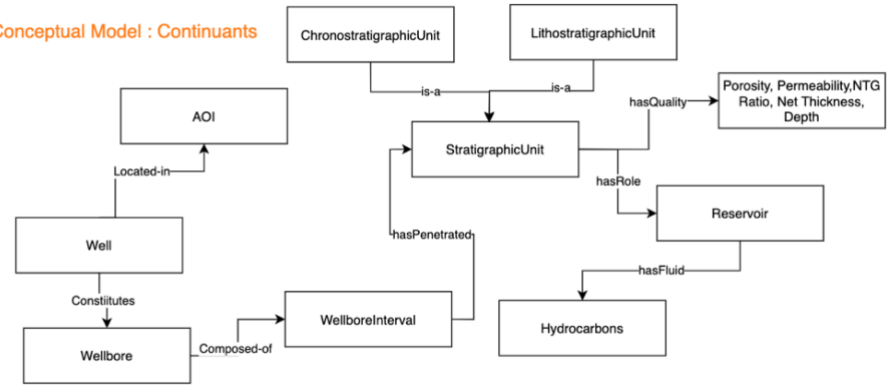
Reservoir
ChronostratUnit
LithostratUnit

Conceptual Model : Continuants



Conceptual Model : Occurrents (one Example)