Context-aware access to ontologies

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Background

http://purl.org/ifgi/projects/swing

http://purl.org/ifgi/projects/GDI-Grid

http://www.envision-project.eu

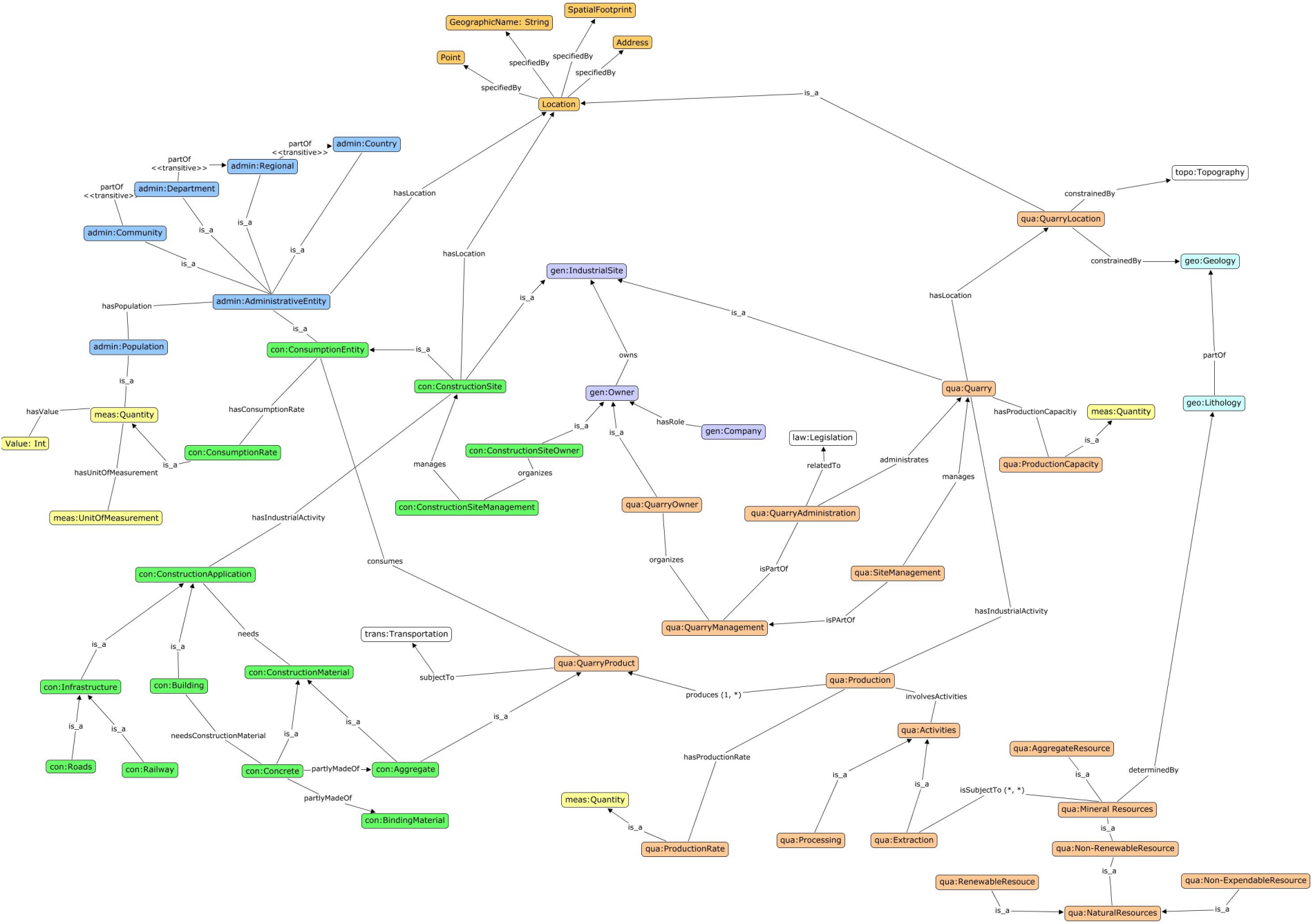
Context:

- Geospatial Decision Making
- Environmental Modelling

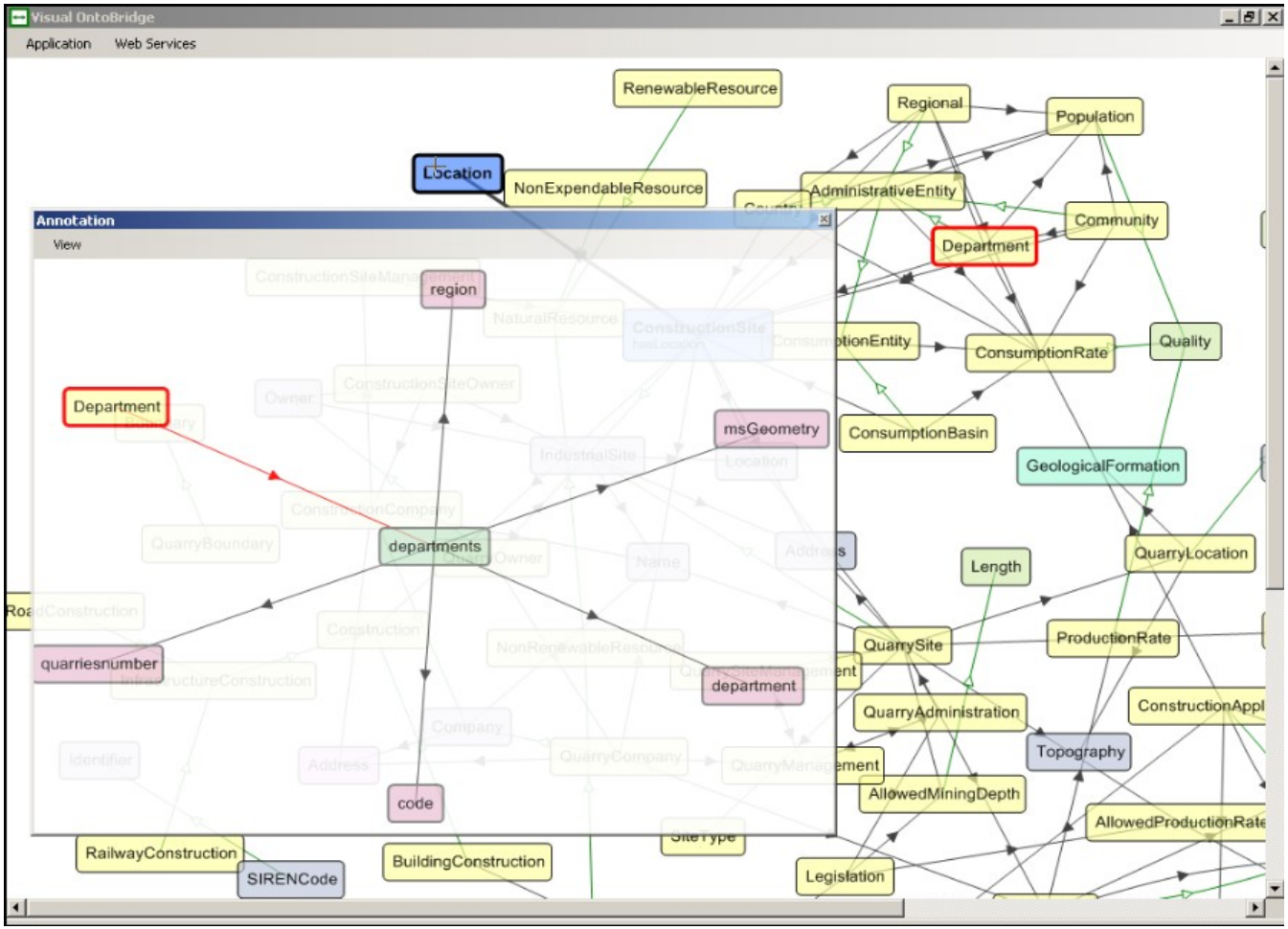
Why Ontologies?

Semantic Annotation of Web services to facilitate

- Discovery & Integration
- Semantic Validation of Workflows


GeographicName: String
SpatialFootprint
Address
Point
specifiedBy
specifiedBy
specifiedBy
specifiedBy
Location
is_a
topo:Topography
constrainedBy
qua:QuarryLocation
constrainedBy
geo:Geology
partOf
geo:Lithology
admin:Country
partOf <<transitive>>
admin:Regional
partOf <<transitive>>
admin:Department
partOf <<transitive>>
admin:Community
is_a
is_a
is_a
is_a
hasLocation
hasLocation
admin:AdministrativeEntity
hasPopulation
admin:Population
is_a
meas:Quantity
hasValue
Value: Int
hasUnitOfMeasurement
meas:UnitOfMeasurement
is_a
con:ConsumptionRate
hasConsumptionRate
con:ConsumptionEntity
is_a
con:ConstructionSite
is_a
gen:IndustrialSite
is_a
owns
gen:Owner
hasRole
gen:Company
is_a
con:ConstructionSiteOwner
manages
organizes
con:ConstructionSiteManagement
is_a
qua:QuarryOwner
organizes
qua:QuarryManagement
isPArtOf
isPartOf
qua:QuarryAdministration
relatedTo
law:Legislation
administrates
manages
qua:Quarry
hasProductionCapacitiy
meas:Quantity
is_a
qua:ProductionCapacity
hasLocation
hasIndustrialActivity
hasIndustrialActivity
qua:SiteManagement
isPArtOf
consumes
con:ConstructionApplication
needs
is_a
is_a
is_a
con:Infrastructure
con:Building
con:ConstructionMaterial
trans:Transportation
subjectTo
qua:QuarryProduct
produces (1, *)
qua:Production
involvesActivities
qua:Activities
is_a
is_a
con:Roads
con:Railway
needsConstructionMaterial
is_a
is_a
con:Concrete
partlyMadeOf
con:Aggregate
is_a
partlyMadeOf
con:BindingMaterial
hasProductionRate
meas:Quantity
is_a
qua:ProductionRate
is_a
qua:Processing
is_a
qua:Extraction
qua:AggregateResource
is_a
isSubjectTo (*, *)
determinedBy
qua:Mineral Resources
is_a
qua:Non-RenewableResource
is_a
qua:RenewableResouce
qua:Non-ExpendableResource
is_a
qua:NaturalResources
is_a

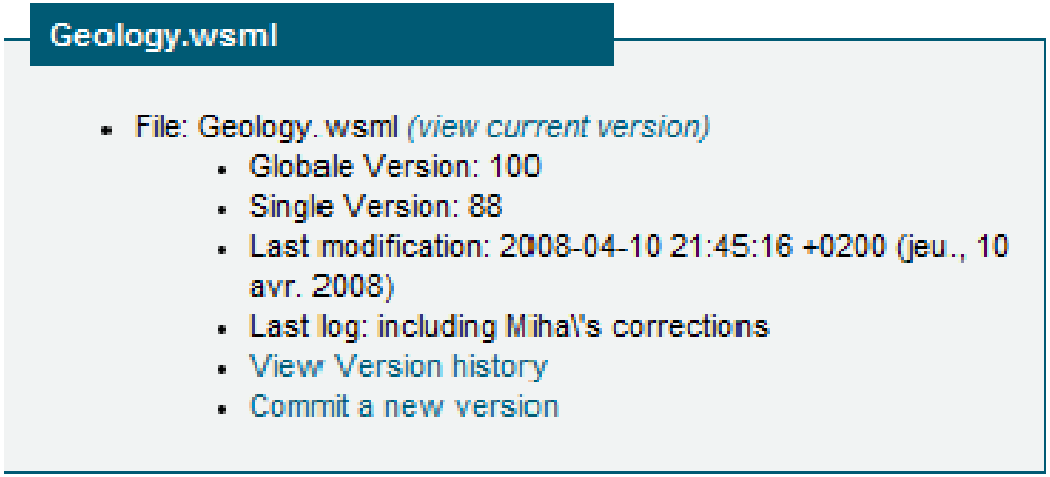
Using Ontologies for Semantic Annotations



Demo Video and Download on SWING website

Serving the ontologies as files (1st Try)

- http://swing.brgm.fr/repository/ontologies
  - File-based approach (Ontology is a file)
  - Versioning via Subversion



Serving the ontologies as files

- http://swing.brgm.fr/repository/ontologies
  - File-based approach (Ontology is a file)
  - Versioning via Subversion
- Drawbacks (also due to the lack of tools)
  - Modularization difficult (borderline cases)
  - Versioning on file-level

Concept Repository (first implementation)

- Focus from Ontology to Concept Definition
- Concept Repository
  - Only serving RDF
    (no added functionality like reasoning)
  - Domains (Context) encoded in namespace
    http://purl.org/net/concepts/Swing/ (context)
    http://purl.org/net/concepts/Administration/Swing/Community
  - RESTful, follows W3C best practice recipes for publishing RDF vocabularies

Concept Repository (current implementation)

- Identifying concepts using DC metadata
  - 1..n dc:title (e.g. River)
  - 0..n dc:subject (e.g. Hydrology)
  - 1 dcterms:version (e.g. 23)
- Encoding in the URL
  - http://../River?subject=Hydrology
  - http://../River_Hydrology
  - http://../Hydrology/River
- Query Actions to retrieve relevant concepts
  - http://../River/neighbors (by traversal)

Concept Repository (Outlook)

- Moving into the cloud (Google App Engine)
  - Backend RDF Storage → distributed data storage
  - Versioning on the object level
- Integrating user feedback for ontology maturing

Thanks.

Source Code, Documentation, et al.
http://purl.org/net/sapience/docs